

Appendix B

RESPONSE TO COMMENTS ON DRAFT EIS

APPENDIX B – RESPONSE TO COMMENTS ON DRAFT EIS

Introduction

Appendix B is the Forest Service response to comments received for the Big Thorne Project Draft Environmental Impact Statement (Draft EIS).

Regulatory Guidance on Use of Public Comment

Response to comments should be the underlying purpose behind the structure of any comment analysis process. Regulations provide clear guidance on both the intent of soliciting public comment and how comment should be used. CEQ regulations require agencies to “assess and consider comments both individually and collectively” (40 CFR 1503.4).

Analysis and Incorporation of Public Comment

Agencies, organizations, and individuals submitted written comments on the Big Thorne Project Draft EIS; the interdisciplinary team (IDT) thoroughly read and objectively analyzed all the comment letters received. Letters from individuals and organizations were considered both individually and collectively, as many of the letters had the same or similar concerns. The comments were annotated and broken out by topic (an internal exercise). In order to avoid repetition and extensive cross-referencing, we have categorized concerns by topic and offered a consolidated response to substantive concerns. Comments fell into two broad categories:

1) Those within the scope of the project:

Comments within the scope of this project have been addressed and incorporated into the Final EIS to the extent practicable. Some comments ask for clarification or additional information in the Final EIS. Other comments requested certain information be considered, requested modification to an alternative, or suggested a new alternative altogether. Many comments are addressed through existing Forest Plan direction and are not incorporated into the Final EIS.

2) Those outside the scope of the project:

Those comments outside the scope of this project have not been incorporated into the Final EIS. Some comments disagreed with the Forest Plan and other regulations decided at a different level, which makes them beyond the scope of this document. Comments that involve issues beyond the analysis area or speculation that does not involve reasonably foreseeable future projects are also beyond the scope of this document.

Letters from Federal and State agencies are published here individually.

Letters Received from Individuals, Organizations, and Agencies

The Forest Service received comments on the Big Thorne DEIS during the 45-day comment period from Federal and State agencies, organizations, and individuals listed in Table B-1 below. All comment letters are located in the project record. Table B-2 lists the comment categories and subcategories as well as the pages where the responses can be found.

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Table B-1. Individuals, organizations, and agencies submitting comments on the Big Thorne Project Draft EIS:

Name	Commenter	City	State
Winston P. Smith	Individual	Juneau	AK
Greg Mickelson	Alaska Power & Telephone Company	Klawock	AK
Brian Sparks	Individual	Sitka	AK
Margaret Clabby	Individual	Ketchikan	AK
John Beck	Individual	Ketchikan	AK
Karen Koolmo	Individual		
Ursula Cohrs	Individual		
Rebecca Siegel	Individual	Juneau	AK
Brian McNitt	Individual	Sitka	AK
Charles D. Caron	Individual		
Bonnie & Haig Demerjian	Individual	Wrangell	AK
Rose Bundy-Hansen	Individual	Kalamazoo	MI
Lydia Garvey	Individual	Clinton	OK
Ralph Wells	Individual		
Robert & Gretchen	Individual	Bend	OR
Tara Orton Kime	Individual	Sitka	AK
Donda Kreatschman	Individual		
Stephen Lawrie	Individual	Sitka	AK
Libby Stortz	Individual	Sitka	AK
Julie Koehler	Individual	Juneau	AK
Marcel LaPerriere	Alaska Cedar Homes	Sitka	AK
Yvonne Carter	Individual	Cleveland	OH
Ginny Olney	Individual	Sitka	AK
Lorraine Inez Lil	Individual	Sitka	AK
Britta Voss	Individual		
Bob Coe	Individual		AK
David Glazier	Individual	Sitka	AK
Scott Brylinsky	Individual	Sitka	AK
Owen Graham	Alaska Forest Association	Ketchikan	AK
Bruce White	Individual	Juneau	AK
Natalia Povelite	Individual		
Gail Sterling	Individual	Port	AK
Robert Durland	Society of American Foresters Dixon Entrance Chapter	Ketchikan	AK
Andrew Thoms	Sitka Conservation Society	Sitka	AK
Keith Rush	The Nature Conservancy	Juneau	AK
Willow Moore	Individual	Sitka	AK
Merav Ben-David	University of Wyoming	Laramie	WY
Buck Lindekugel	Southeast Alaska Conservation	Juneau	AK
Jon Bolling	City of Craig	Craig	AK
Tina Brown	Alaska Wildlife Alliance	Anchorage	AK
Marian Allen	Individual	Sitka	AK

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Name	Commenter	City	State
Austin Williams	Trout Unlimited	Anchorage	AK
Mark Rorick	Juneau Group of the Sierra Club	Juneau	AK
Stephen Todd	Individual	Wrangell	AK
Pamela Bergmann	US Department of the Interior Office of Environmental Policy and Compliance	Anchorage	AK
Mike Papac	Papac Alaska Logging Inc.	Craig	AK
Suzy Arnold	Individual		
Sarah Kellog	Individual		
Bill Bards	Individual		
Wayne Duloff	Individual		
Martha Smith	Individual		
Telline R. Lankford	Individual	Craig	AK
Kate E. Lankford	Individual	Craig	AK
George Harleson	Individual		
Frank Lundin	Individual	Craig	AK
Travis Gearhardt	Individual		
Kelly Fike	Individual		
Sandy Trendin	Individual		
Kyle Moselle	The State of Alaska	Juneau	AK
Larry Edwards	Cascadia Wildlands, Center for Biological Diversity, Greenpeace, Greater Southeast Alaska Conservation Community, Tongass Conservation Society		AK
Jean Public	Individual	Flemington	NJ
David Beebe	Individual	Petersburg	AK
Rebecca Knight	Individual	Petersburg	AK
Sherry Tomes	Individual		
Michael Kampnitch	Individual	Craig	AK
Eric Myers	Audubon Alaska	Anchorage	AK
Chris Michael Carroll	Individual	Sitka	AK
Thomas Waldo	Earth Justice, Natural Defense Council, Southeast Alaska Conservation Council, Sitka Conservation Society, Sierra Club Alaska Chapter, Greenpeace, Tongass Conservation Society, Audubon Alaska, Greater Southeast Alaska Conservation		

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Name	Commenter	City	State
	Community, Center for Biological Diversity, Alaska Wilderness League, Alaska Conservation Foundation, Wrangell Resource Council		
Christine B. Reichgott	Environmental Protection Agency	Seattle	WA
Dave Kiffer	Ketchikan Gateway Borough	Ketchikan	AK
Renee Roman Nose	Individual	Tulalip	WA
Richard Cartensen	Individual	Juneau	AK

Table B-2. Responses to these comment topics appear on the following linked (hold Control and click) pages:

Comment Category	Comment Subtopic
Botany	Invasive plants
Economics	Jobs and exported timber
	Non-timber product values analysis
Fisheries	Essential Fish Habitat (EFH)
	Fish Habitat
	IDT Involvement
	Red Culverts
	Red Culvert Locations
	Road Location and Stream Crossings
	Stream Temperature
Forest Plan	Amendment to the Forest Plan
	Climate Change
	Falldown
	Management of Phase 2 lands
	Multiple Use Goals
	Timber demand and export
	Timber supply and demand
	Viability of wolves on the Tongass National Forest
Hydrology	Acid Rock Drainage
	Alternative 5
	Clean Water Act and NEDC v. Brown ruling
	Falls Creek
	Forest Plan Standards & Guidelines
	Peak and Low Flows
	Road Effects
	Road surface area in watersheds
	Stream Flow
	North Big Salt Lake watershed
	Watershed Analysis, Cumulative Effects and Insufficient Information

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Comment Category	Comment Subtopic
Karst	Caves
NEPA	Relationship with the State of Alaska
	Information from the Alaska Department of Fish & Game
	Recommendations for the Decision
	Public Involvement and the NEPA Process
	Purpose and Need
	Range of Alternatives
National Direction	Stewardship
Recreation	Tourism and Recreation Economy
Regional Direction	Transition Framework
Regional Policy	Export of Timber
Scenery	Clearcuts and Scenery
	Visual Buffers and Blowdown
	Visual Priority Routes and Use Areas
Silviculture	Benefits of Pre-commercial Thinning
	Partial Harvest prescriptions
	Clearcuts Over 100 Acres
	Clearcutting and Reforestation
	Disclose Regeneration Surveys by Elevation
	Justification for Clearcutting
	Legacy Design and Structure
	Mitigation Measures for Yellow-cedar
	Reasonable Assurance of Windfirmness (RAW) Buffer Review
	Thinning for Wildlife or Timber
	Uneven-aged Management Harvest Prescriptions and Volumes
	Windthrow Risk Evaluation
	Yellow-cedar Conservation Strategy
	Yellow-cedar Decline and Impacts to Redcedar
	Yellow-cedar Regeneration
	Young Growth Management
Soils	Soils
Subsistence	Subsistence
Timber	Ten Year Sale Contracts
	Concentrating Timber Sales on Prince of Wales Island
	Alternate uses for non-sawtimber products
	Commercial Thinning
	Disproportionate Harvest of High-Volume Old-growth Forest
	Economics of helicopter yarding
	Economics of young growth harvest
	Preference for small or microsales
	Progress of Implementing the Transition Framework Strategy

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Comment Category	Comment Subtopic
Timber Economics	Competitive bidding
	Financial efficiency analysis
	Forest Service Administrative Costs
Transportation	Effects of temporary roads
	Leave roads open
	Minimum road systems
	Relationship to Access Travel Management (ATM) plan
	Road Cards
	Road closure commitment/maintenance as mitigation
	Road construction to lower standard
	Road costs and public works costs
	Road decommissioning
	Roads do not meet current standards
	Road funding sources, road maintenance, purchaser election option
	Road maintenance backlog
	Road maintenance, decommissioning, and range of alternatives
	Road maintenance funding and Cumulative Effects
	Road monitoring requirements – Project Related
	Road storage categories, level of storage
	Road storage self-maintaining road, monitoring
	Road storage and stream crossing structures
	Inadequate Road survey data
	Storage methods, irretrievable commitment
	Temporary roads as temporary fills
	Temporary roads with drainage structures
	Transportation Analysis incomplete
	Transportation range of alternatives
Wetlands	General Comments
	Survey data quality
	Wetland Avoidance
Wildlife	Black Bears
	Cavity Nesters and Marbled Murrelet
	Effects of Conservation Strategy and Climate Change
	Core Wildlife Analysis Areas (WAAs)
	Deer Habitat Capability
	Deer Model
	Harvest of Productive Old Growth (POG), Large Tree Productive Old Growth, and Fragmentation
	Goshawks
	Marten
	Wolves/Wolf Mortality and Road Density
	Wolf Habitat Management Program
	Prince of Wales Flying Squirrel and other Endemic mammals

Comment Category	Comment Subtopic
	Modification of Old-Growth Reserves and Landscape Connectivity
	Scale of Analysis
	Thinning in All Alternatives
	Wildlife Travel and Elevational Corridors
Unit specific	Individual unit economics and selection
	Do not include Legacy Forest Structure (legacy areas)
	Plots to assess timber value
	Road economics
	Unit expansion
	Unit preference
	Volume estimates
	Road and Unit-specific comments

Botany: Invasive plants

Commenters have expressed concerns about invasive plants spreading on Prince of Wales Island, and are interested in more detail about the invasive plant risk assessment and the possible effects of spread.

“Please explain and consider the results of this risk assessment in the Final EIS.”

“Aside from comparing gross numbers of acres and road miles among alternatives, however, the Draft EIS does not accomplish its stated goal of considering project impacts on invasive species. How much might the project expand invasive infestations? Are there meaningful thresholds?”

“What are the habitat impacts of these infestations.”

“Please provide usable, quantified information as to the results of invasive plant spreads”

Forest Service Response:

The Forest Service is also concerned about the introduction and spread of invasive plants. On the Tongass, our Forest Plan includes the Standards and Guidelines to provide direction for managing invasive species on the Forest (USDA Forest Service 2008b). In addition, the Forest Service Manual 2900 Invasive Species Management and Forest Service Manual 2080 Tongass supplement number R10 TNF-2000-2007-1 provides with Exhibit 1, 4, and 5, additional guidance, including the directions and procedures for conducting the risk assessment. This process has been followed for the Invasive Plant Risk Assessment for the Big Thorne Project, and the results, or risk determination, are included in the FEIS and the project record (Opolka 2013c).

Given the nature of invasive plants, it is difficult to analyze the impacts that a specific project may have on invasive plant introductions and spread, since the germination of any invasive plant species could happen after the project is completed or come from another source. Therefore, the monitoring recommended for the project spans several years to be able to respond to any new infestation, even if it is not apparent during implementation.

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Since the immediate effects to a project by invasive plants are difficult to analyze, the harvested acres and road miles are used as a way to compare alternatives based on the potential vectors present and potentially suitable habitat created (i.e., increased sunlight and soil disturbance as a result of timber harvest and road building). We know that it is possible for road building or maintenance equipment or logging equipment to get invasive plant seeds caught up in the machinery or material and transported to another area, but it is also possible that it will not happen. There are very few examples of weed infestations on Prince of Wales Island that occupy shady conditions, such as the understory of forests. Typically invasive plant infestations occur along roads and disturbed sites (including naturally disturbed habitats). Using the acres of harvest by prescription and logging system, in addition to miles of roads, provides a measure to compare alternatives due to the change in habitat conditions. While the total acres of harvest do not accurately measure the extent of some future infestation, it may be used as a comparative measure, since the results of disturbance (increased sunlight and exposed mineral soils) may trigger establishment and eventual spread of invasive plants within the disturbed sites. The analysis provided in the risk assessment uses this logic to predict that the more acres that are harvested, the more potential areas invasive plants could be introduced or spread. For additional information on the general types of effects and risks from road construction and timber harvest, see the “Effects from Timber Harvest” and “Effects of Roads” in the FEIS and in the Invasive Species Resource Report (Opolka 2013b).

The potential habitat impacts caused by invasive species infestations can vary greatly by the types of habitats infested and the specific plant species that invades the habitat. The risk assessment takes this into consideration; see the “Habitat Vulnerability” section of the Risk Assessment. Certain habitats will be more vulnerable than others. For example, roadsides and stream banks are disturbed sites with exposed mineral soils and relatively high amounts of sunlight. These habitats have a higher vulnerability to invasive plant introductions than closed canopy forests, with little to no exposed mineral soil and very low sunlight levels. In addition, some of these habitats could have very negative effects from invasive plant infestations. Some types of wetlands and stream banks, for example, have a high vulnerability and the negative consequences of infestations to the natural ecosystem could be fairly high. Reed canary grass can grow and spread rapidly, forming dense monocultures with matted root systems (Lyons 1998). These monocultures can out-compete native vegetation and affect species richness (Perkins and Wilson 2004). It is also possible that these dense mats of reed canary grass may slow stream flow and alter the scour needed for salmon reproduction (AKEPIC 2005). It is impacts such as these that make invasive plants a concern on our landscape and why it is especially important to develop the mitigation measures necessary to follow our Forest Plan and Forest Service Manual direction to minimize or eliminate the possibility of the establishment of invasive plants.

Other than using habitat vulnerability and potential vectors to compare alternatives, another source for usable, quantifiable information for the rate of spread anticipated by invasive species is the Invasiveness Ranking efforts that have been done by the Alaska Natural Heritage Program (ANHP). The invasiveness rankings are based on several criteria, broken down into ecological impacts, biological characteristics, dispersal ability, and distribution. For more information on how the rankings are determined, see the ANHP website: <http://aknhp.uaa.alaska.edu/botany/akepic/non-native-plant-ranks-and->

biographies/#content , and the Invasive Plants Introduction section of the FEIS.

ANHP rankings have been completed for most of the non-native plant species found within the Big Thorne Project, and can be found within Appendix B of the Invasive Plant Risk Assessment. These rankings have been used as one measure for the determination of the overall risk of invasive plant spread as a result of this project; see the “Inventory” section of Table 14 in the Invasive Plant Risk Assessment. The inventory provides information on the invasiveness of an existing species in addition to the frequency and extent of occurrences. Species with a high invasiveness ranking and a high number of occurrences may have a high risk of spread, even under the “no action” alternative.

The risk assessment and the determination considered the proposed project activities in conjunction with the current condition found during the inventory. Even with the no action alternative, under the current condition, given the species known and number of infestations, there is still a moderate to high chance of spread along the existing road system, considering the ongoing recreation, subsistence, and resource management that occur. The risk assessment then takes into account the additional risk associated with the project’s action alternatives to determine the potential increased risk associated with project implementation. These determinations are in the FEIS and Invasive Plant Risk Assessment.

Given the determinations made in the risk assessment, it was clear that mitigation measures should be recommended to reduce the potential risk. The mitigation measures for this project were designed to have components of prevention, early detection (through monitoring) and rapid response, as well as control and management, which is consistent with the direction provided in the FSM 2900 and FSM 2080, R10 TNF supplement 2000-2007-1. The recommended mitigation measures of equipment washing, treating known infestations, and designating approved rock sources will help prevent the introduction of new infestations and limit the chance of spread for the current ones. Treating current infestations will help to reduce the risk within the “Inventory” section of the risk assessment, and help minimize the potential seed sources for some of the highest-ranking invasive plants. Monitoring will lead to the early detection of any new infestations, so that we are able to rapidly respond while the infestations are small, and hopefully eradicate them before they become well established.

Even though there are no definitive “thresholds” addressed in the direction from the Forest Service Manual 2900, the FSM 2080, R10 TNF Supplement 2000-2007-1, or Executive order 13112, those documents do provide the policy and direction to “Ensure that all Forest Service management activities are designed to minimize or eliminate the possibility of establishment or spread of invasive species on National Forest System, or to adjacent areas.” This direction, given the known risks associated with the current condition of the project area and proposed actions, has driven these mitigations measures. These mitigation measures are establishing a threshold that if there is an introduction of any new species or infestations, it would be treated as a part of the Prince of Wales Invasives Program of Work. In other words, the threshold for this project would be that invasive plant infestations would not increase from current levels.

The completed risk assessment and determination, in accordance with Forest Service Manual 2080 tR10TNF Supplement 2000-2007-1, and Executive order 13112, address the

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risks associated with project implementation of all alternatives. This determination lead to the development of the mitigation measures to help prevent, monitor, and control the introduction and spread of any invasive plants within the project area as a result of the Big Thorne Project.

Economics: Jobs and exported timber

Several commenters were concerned by the number timber industry jobs in Southeast Alaska that this project would support and whether the timber would be processed locally or shipped to the other states or overseas and what effect that would have on Southeast Alaska jobs.

“In particular, the DEIS did not provide an accurate assessment of job and income generation based on a realistic analysis of exports and interstate shipments of raw logs out of the region. This information was important so that the public could evaluate whether the project would fulfill the stated purpose and need for the project.”

“The DEIS asserts that the employment estimates reflect approximate numbers on average jobs per MMBF ratios that were estimated based on harvest and employment data from 2007 to 2010. These assertions are unreasonable and further NEPA analysis should provide corrections that reflect actual mill employment in light of updates to the export policy and actual export levels.”

“The table that displays projected employment mischaracterized the total annualized jobs and income by suggesting an upper range without providing any supporting data to support the assumption that there would be no export of hemlock, spruce and red cedar, and 50% local processing of yellow cedar.”

“The DEIS should provide more accurate data to support the assumption that purchasers would elect to process 50% of the cedar and all other sawlogs locally.”

“Further, the DEIS should consider how large scale export-driven projects designed for cedar exports will affect the emerging small mill industry on Prince of Wales Island.”

“Also, the inclusion of transportation and service jobs in Table E-6 warrants further explanation. To what extent does the generation of export industry jobs reflect guidance from the TLMP or analysis in the TLMP FEIS? Further, there was no citation to employment data and no explanation of the methodology used to estimate the employment numbers.”

Forest Service Response for Jobs:

Timber sales are sold to purchasers with different business goals and under changing markets. Historically, the percentage of the volume harvested on the Tongass that has been shipped out of state has fluctuated. Therefore, it is not possible to accurately predict what will be manufactured locally; hence, a range of employment and income figures is considered the most reasonable approach to display potential effects on jobs and income. Purchasers are trying to make a profit, and want to optimize the value of their products. They may use export to do this. Volume from many timber sales does get shipped out of state to optimize the return to the purchaser.

Employment data was included in the DEIS, Table TSE-13, p. 3-35, and has been updated in the FEIS. Footnotes to this table explain how they were calculated based on the volume calculated by the financial efficiency program, FASTR, and employment coefficients determined by the Regional Economist (Alexander 2012). FASTR calculates an upper and lower estimate, based on two scenarios because it is impossible to predict the amount of timber that may be exported from a given timber harvest contract. Most years it will neither be all domestically processed nor up to the maximum exported. Information on the amount of volume exported from 2001 to 2011 is located on the Alaska Regional Office website http://www.fs.fed.us/r10/ro/policy-reports/for_mgmt/ and shows a range of 2.7 MMBF to 19.5 MMBF. The upper estimate value assumes that all project volume is processed locally with the exception of Alaska yellow-cedar and young growth of any species. The lower estimate value assumes that 50 percent of the total sawlog volume in hemlock and spruce are exported, as well as all of the Alaska yellow-cedar and young growth. Annualized jobs estimates have been updated in the FEIS based on the changes to alternatives described in the “Changes between DEIS and FEIS” section in Chapter 2.

Western redcedar is only exportable after queries have been made first in Southeast Alaska markets and then in the rest of the United States and cannot be exported overseas until lack of domestic processing need is determined. In addition, there is a contract provision that provides a monetary incentive for local processing of Alaska yellow-cedar and western redcedar. See Timber Economics: Financial Efficiency Analysis.

It is difficult to make quantitative comparisons between small and large mill employment based on the available data, since reported employment does not necessarily distinguish logging versus sawmilling jobs, nor does it necessarily differentiate between part-time, seasonal and full-time employment. Some of the small mills tend to operate sporadically or seasonally and process only small volumes sometimes less than 100 MBF. However, in the small communities on Prince of Wales Island, these mills represent an important part of the economy and indirectly support other employment such as retail sales and public schools.

The information displayed in the DEIS, p. 3-21 to 3-23 and included in the FEIS was from the reports “Estimated sawmill processing capacity for Tongass timber: 2007 and 2008 update”, Alexander and Parrent, 2010; “Estimated sawmill processing capacity for Tongass timber: 2009 and 2010 update”, Alexander and Parrent, 2012; and “Tongass Sawmill Capacity and Production Report for CY 2011”, Parrent, 2012.

The size and number of small sawmills on Prince of Wales Island does fluctuate and may increase as opportunities for smaller volume timber contracts and microsales increase due to this and other NEPA projects.

Economics: Non-timber product values analysis

Commenters felt that the DEIS failed to provide a thorough analysis of the effects this project would have on non-timber related resources such as subsistence use, recreation and commercial fishing.

“Neither the analysis of the economic efficiency of the project nor the discussion of the impacts of various alternatives acknowledged the real economic costs associated with declining fishery and wildlife populations in the area. The

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presentation of the information in the DEIS deprived the public of the opportunity to adequately consider subsistence resources, recreational values and fishery values and whether the substantial public investment necessary to maintain the Forest Service's timber program warrants risking other resource values."

"...please include a discussion of the local subsistence economy in the financial efficiency analysis."

"The project area is also a multiple use resource area for local residents that depend on area food resources. But the project area has been prioritized for only one use, logging, from the pulp mill days until now. A Big Thorne ten year sale does not balance multiple uses, it adds to the imbalance."

Forest Service Response:

Benefits and activities such as commercial fishing, tourism, recreation and subsistence are not assigned monetary values and quantified in an economic analysis at the project level. The benefits of the project area to these industries are discussed, as practicable, in the analysis for the Big Thorne Project and will be considered when a decision is made.

The Forest Service is not required to quantify, in monetary terms, all of the costs and benefits associated with non-market impacts, and under most planning and project conditions, all costs and benefits cannot be monetarily valued. However, the Forest Service is required to "ensure that un-quantified environmental amenities and values [are] given appropriate consideration in decision-making along with economic and technical considerations" [42 USC 4332(2) (B)]. The DEIS discusses the potential effects of the project on the non-market values, such as subsistence, wildlife, recreation, fisheries, water quality, soils, and wetlands, as well as the impacts to inventoried roadless areas. The Forest Service Manual [FSM 1970.6] states, in part, that "the responsible line officer determines the scope, appropriate level, and complexity of economic and social analysis needed." The analysis of the project's potential effects on these non-market values is reasonable and consistent with Forest Service Manual and Handbook guidance regarding social and economic analyses.

The other consideration is that the proposed timber harvest occurs in areas designated for that activity by the Forest Plan (development land use designations – 3.4 million acres). Many other areas were determined to be better suited and more valuable for other resources/activities such as recreation, mining or scenery (non-development land use designations – 7.4 million acres). Wilderness areas, which were previously designated by Congress, encompass 5.7 million acres. See Table 1, page 5 of the Forest Plan ROD. Complete descriptions of the objectives for these LUDs are found in Chapter 3 of the Forest Plan. Forest Plan Standards and Guidelines minimize effects to resources such as fish, soil and water quality where timber harvest can occur. Therefore, the Big Thorne Project analysis of these resources is tiered to the analysis in the Forest Plan FEIS, pp. 3-511 to 3-523; pp. 3-539 to 3-543, and pp. 3-548 to 3-556.

The types of benefits that cannot be reasonably assigned a monetary value at this time are generally classified as ecosystem services. Ecosystem services are those services and benefits provided by healthy ecosystems. Definitions of ecosystem services can be broad and include both use and non-use values. A number of different definitions have been

identified, including a typology developed by the Millennium Ecosystem Assessment (2005), which is featured on the Forest Service's Ecosystem Services website (<http://www.fs.fed.us/ecosystems-services/>). The Assessment identifies four general categories of ecosystem services: provisioning, regulating, cultural, and supporting. Interest in ecosystem services has increased in recent years, and economists have made useful progress in developing and improving methods and techniques that can be used to value non-market ecosystem services.

Recognizing the potential utility of the ecosystem services concept, the Forest Service recently proposed that ecosystem services be used as a framework for describing and evaluating the many benefits associated with NFS lands and established an Ecosystem Services web site that provides detailed information and resources, identifies and discusses Forest Service efforts in this area, and issues a regular Ecosystem Services newsletter.

In addition, the Forest Service's Pacific Northwest Research Station (PNW) published a technical report that defines an economics research program to describe and evaluate ecosystem services (Kline 2006). Kline (2006, p. 7) identifies several key challenges or steps that are involved in applying the ecosystem services concept. These include defining a typology of ecosystem services (i.e., defining what to measure and how to measure it). An important aspect of this measure involves, in Kline's (2006, p. 10) words: "translating ecosystem complexity into manageable sets of well-defined ecosystem metrics." The next challenge is to determine how these metrics are affected by specific Forest policy and management actions and, then, identifying these effects in terms of measurable units or outputs that can be assigned monetary values in a way that will allow meaningful comparison between alternatives. The third challenge is to measure the value of these units or outputs in monetary terms that accurately reflect the societal values of these services.

As Kline (2006, p. 15) notes, "total ecosystem values provide little guidance to policy or management decisions unless these decisions can be expressed as marginal or incremental changes in ecosystem services." Evaluating the impacts of the alternatives on subsistence in these terms, for example, would require quantifying the potential impacts to subsistence in pounds of edible resources potentially foregone. In the case of deer, it would require estimating the actual number (or at least a reasonable range) of deer affected, negatively or positively, by the alternatives. This type of analysis would also be required for salmon, marine mammals, moose, berries, and so on. The ecological impact assessments presented in this EIS follow standard scientific approaches to these types of analysis and typically assess impacts in terms of probability and risk, not in numbers of affected deer or salmon, etc. The difficulties associated with identifying production relationships and the corresponding units of measurements is, as noted earlier, generally considered one of the main challenges currently facing ecosystem services analyses. Kline (2006, p. 11) notes that, in general, "ecologists have not been forthcoming with the types of ecosystem output measures economists typically desire or expect for formal economic analysis" and because "ecology is not particularly well suited to prediction, production relationships may be highly or purely uncertain."

Project-level impacts to subsistence, recreation (which includes outfitter guide use and special use permits within the project area), scenery and fisheries can be found in Chapter

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3 of the Big Thorne Project DEIS and FEIS.

Fisheries: Essential Fish Habitat (EFH)

One commenter expressed concern that the consultation process with NMFS and their recommended mitigation measures on EFH were not fully disclosed in the DEIS and requests that the complete analysis of EFH, the consultation with NMFS, and all mitigation measures recommended by NMFS be disclosed in the FEIS.

“Please provide a complete analysis of the EFH issues and consultation with NMFS in future EISs. Mitigation measures recommended by NMFS should be considered and discussed specifically. In the past, we have noticed that the Forest Service tends to pick and choose which recommendations it would like to disclose and follow. At minimum, please address all NMFS concerns specifically in the EIS.”

Forest Service Response:

The DEIS (pages 3-341 to 3-349) outlines the requirements of the consultation process with NMFS and contains the full analysis of effects to essential fish habitat. The Forest Service determined that the Big Thorne Project may adversely affect both freshwater and marine EFH, therefore requiring consultation with NMFS. Per the Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation Procedures between the Alaska Region USFS and Alaska Region NMFS, a copy of the Big Thorne Project DEIS was sent to NMFS to initiate formal consultation. NMFS chose not to comment on the Big Thorne Project which, according to the agreement, concludes the consultation.

Fisheries: Fish Habitat

Commenters have stated the DEIS failed to provide a complete analysis of impacts on fish habitat and populations and the resulting resource and economic impacts to commercial, sport and subsistence fisheries. There were additional concerns that information about salmon productivity should have been disclosed, as well as information about fish kills in the vicinity of the project.

“One missing piece of the EIS analysis is, what are the limiting factors for fish populations in terms of habitat? These factors may not be the same for all watersheds. For instance, some systems may be limited in winter habitat, while others have plenty of that but are limited by spawning habitat. Knowing what factors are most important for fish, is critical to evaluating the significance of environmental impacts. The DEIS just generally relies on literature displaying averages and general principles, without regard for what factors specifically are limiting in the project area.”

“In our scoping comments, we requested that the watershed analysis and/or DEIS should discuss the value of area watersheds as sportfish and salmon producers. ADF & G has provided information in previous comments on timber projects that allows for the public to review the contribution of watersheds to specific fisheries. This information needs to be in the DEIS. The DEIS should also disclose whether

any specific populations in the project area currently require harvest restrictions or other protection, and whether those restrictions are related to road or logging impacts. Please also review the Audubon/Nature Conservancy Conservation Assessment rankings for high value watersheds in the project area. Finally, please identify any unique or high-value salmon or trout populations that may merit special management protections.”

“The economic ramifications of damage to fish habitat should be considered. If there are fewer fish as a result of damaged habitat in the project area, then it stands to reason that fishermen will catch proportionately fewer fish. Yet the DEIS and resource reports simply rest on the assumption that fishing is good, without effort to consider the linear, proportional effect of degraded habitat.”

Forest Service Response:

All the information disclosed in Chapter 3, Issue 4 was used in analyzing impacts to fish habitat (aquatic habitat) and consequently effects to fish populations (fisheries). In the Big Thorne DEIS and the FEIS, the Fisheries section tiered back to Issue 4 for parameters that were discussed there and disclosed additional information relevant to fish habitat and fish populations.

Tables FISH-2 and FISH-3 in Chapter 3 of the Big Thorne DEIS and Tables FISH-2 and FISH-3 in FEIS provide the miles of anadromous and resident streams in each watershed and the miles in each process group. Table FISH-2 provides the miles of stream by process group which gives an indication of the amount of spawning and/or rearing habitat available in each watershed. Table FISH-3 demonstrates the substantial amount (642.7 miles) of fish habitat in the project watersheds and is an indicator of the value of these watersheds for fish production. In the DEIS and the FEIS, the Forest Service disclosed that the Alaska Department of Fish & Game rated eight VCUs (5750, 5760, 5780, 5860, 5950, 5960, 5971, and 5972) as Primary Fish Producers. In 2007, The Nature Conservancy and Audubon Alaska prepared “A Conservation Assessment and Resource Synthesis for the Coastal Forests and Mountains Ecoregion in Southeastern Alaska and the Tongass National Forest”. Discussion of this conservation assessment and resource synthesis has been added to the Fisheries Resource Report. The Fisheries and Subsistence sections of Chapter 3, and the Final Fisheries Resource Report, in the project record, contain additional discussion about fish species in the project area and subsistence harvest. Additionally, the Fisheries section of Chapter 3 identifies Eagle Creek, Thorne River, and Ratz Creek as important fish-bearing water bodies. The Fisheries Resource Report contains additional information on systems that are important subsistence streams.

On Prince of Wales Island, fish kills have occurred in both harvested and unharvested watersheds. However, very few fish kills have been documented in the watersheds of the project area (Halupka et al. 2000). The Fisheries Resource Report contains additional information regarding factors contributing to pre-spawn mortality in salmonids on pages 33-34.

The Draft and Final EIS acknowledges that the Big Thorne Project may adversely affect fish habitat by potentially increasing stream-flows, increasing sediment delivery, altering riparian vegetation, disturbing channel integrity and blocking upstream movement at road crossings. However, it also determines that the action alternatives would result in minor

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effects or moderate effects (depending on the subwatersheds) on water quality and aquatic habitat due to the implementation of Forest Plan Standards and Guidelines. The DEIS (page 3-266) includes definitions that provide additional information that bounds each of the descriptors: how measurable the effect would be, how widespread it would be, and how long it would last. We acknowledge that these descriptors are subjective. We do not have predictive models or baseline data for most of the aquatic parameters likely to be affected by timber harvest activities. The effects conclusions are supported by the Watershed and Fisheries Resource Reports. It is anticipated that the valuable fisheries in the project area will not be measurably affected. For a more thorough explanation of how economic concerns are addressed in the Big Thorne EIS, see the response for “Economics: Non-timber product values analysis”.

Fisheries: IDT Involvement

One commenter expressed concern that the fisheries resource staff was not part of the interdisciplinary process as required for unit design and mitigation measures that require site-specific decisions.

“The Fisheries Report does not reflect a great deal of unit-specific involvement. The Fisheries Report (See Knutzen 2012 at pp.A-1 et seq.) simply lists out the units with brief mention of streams and unstable soils in the units. However, there is no obvious staff input into unit design or mitigation measures, as would be expected and as is required by an interdisciplinary planning process. We speculate that units were handed to fisheries staff as is, and they were told to rationalize the approach through their NEPA documentation. Resource staff then apparently went through units and plugged in boilerplate language. Things should be the other way around: it should be the site-specific analysis by resource specialists that drives unit design and project decisions. This process must be documented in the EIS.”

Forest Service Response:

As shown in the interdisciplinary meeting notes located in the project record, the fisheries biologist attended the meetings and was an active participant. The fisheries biologist provided site-specific field information to determine appropriate protection measures and unit design for each alternative. Streams and stream buffers dictate a large part of the unit design. This site-specific field information is located in the project record and includes unit stream reports, proposed road stream crossing reports, and watershed improvement tracking road surveys. The Fisheries Resource Report summarizes this field information in Appendix A. BMPs are located in each unit card.

Fisheries: Red Culverts

Commenters have expressed concerns that red culverts were identified in the Big Thorne project area and do not meet current Forest Standards and Guidelines and BMPs, and are not in compliance with the Clean Water Act. They state that the DEIS does not adequately describe the impacts from red culverts on fish and the loss of access to upstream habitat over-time from the implementation of the POW ATM, the Tongass-wide prioritization list, and the Big Thorne project delaying removal or replacement. The commenters have requested that the FEIS discuss the importance of the lost habitat in

regards to the loss of production capacity over-time from red culverts and should analyze further the habitat that is impacted and not available or only partially available. The potential for correcting some or all of these culverts should be investigated as part of this project.

One commenter requested the 99 red culverts in the project area that contains 43 percent of the anadromous and resident upstream fish habitat be placed as the highest priority on the Tongass-wide prioritization list.

“With the exception of the five red culverts in the "replacement 2012" category, the DEIS does not adequately describe the impacts from red culverts over time (i.e. No Action Alternative) since it is undefined when corrective actions will be implemented and fish passage restored.”

“The cost of foregone red culvert replacements is substantial – the DEIS identifies 27 such culverts under Alternative 3, influencing access to 4.73 miles of upstream fish habitat, with the other Alternatives influencing about 3 miles of fish stream habitat. While it is good that only 0.13 miles are on Class I streams, trout and other resident aquatic species are also valuable and deserving of protection. It should also be considered that stream classifications have a substantial error rate. In the Final EIS, please consider the importance of this lost habitat. What is the production capacity of 3-5 miles of fish stream habitat?”

“The DEIS assures us that no alternatives would affect scheduling of scheduled red culvert work. Of the 155 red culverts in the project area, 108 “will be prioritized for replacement independent of project actions.” There are 42 red culverts on roads proposed for storage under the POW ATM. DEIS at 3-339. Table 24 on p.73 of Knutzen 2012 lists schedule of red culvert replacements. It is a safe assumption that, as a consequence of choosing an action alternative, these 42 red culverts will forego storage and remain red culverts for the duration of the timber sale (until eventual decommissioning, 1-5 years post-use). The DEIS indicates there are from 16 to 27 of these potential project removal red culverts.”

“All of the known upstream anadromous and 43 percent of the known upstream resident fish habitat would be reconnected by replacing these 99 red culverts. Therefore, these 99 culverts should be prioritized highest for corrective action under the Tongass-wide prioritization list.”

Forest Service Response:

The Tongass National Forest is concerned about the loss of fish habitat upstream from culverts restricting fish passage and has corrected approximately 340 red crossings throughout the Forest since 1999, not including red culverts removed through storage of approximately 200 miles of road across the Forest in 2011. It may not be advisable or feasible to replace all existing red culverts with fish passage designed crossings. Though a crossing may be categorized as red, it may not impede larger fish and may even pass fish of all sizes during certain stream flow levels. Furthermore, many of the crossings have very limited amounts of fish habitat upstream. The replacement of red culverts to improve fish passage is prioritized on a Forest level, and is anticipated to reflect the best use of

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funds allocated by Congress for this purpose.

Refer to the fisheries section of the DEIS (pp. 3-326 to 3-349) and the fisheries resource report (pp. 73-80) for more information on site-specific impacts of existing red culverts on access to upstream habitat. There are 42 red culverts that have been identified in the project area that may have potential for removal at the end of this project. Final decisions on removal of red culverts will be made in the ROD or during implementation on a case-by-case basis. None are scheduled to be replaced as part of the timber sale, as timber sales are not required to bear the costs of culvert repair for fish passage.

Title 16 concurrence is required prior to conducting any instream activities below ordinary high water of a fish-bearing water body per a Memorandum of Understanding (MOU) between the State of Alaska Department of Fish and Game Division of Habitat and the Forest Service, Alaska Region. The MOU outlines the concurrence process which begins when the Forest Service provides a Notice of Instream Activity to the Division of Habitat.

All road construction and reconditioning will be completed in conformance with Forest Plan Standards and Guidelines and best management practices (BMPs).

The DEIS states, "[a]ll fish stream crossings installed on new roads in all action alternatives will be designed to meet fish passage standards" indicating that the project will comply with the CWA. These actions are expected to result in no measurable direct or indirect effects to fish passage in the project area as all fish crossings will be crossed with log culverts or bridges." The effects to fish passage from existing and proposed roads are discussed in the Big Thorne Project Fisheries Resource Report. The DEIS states "[i]n the No-Action Alternative, roads would be stored or decommissioned or culverts replaced under the Prince of Wales ATM ... when funding becomes available." The DEIS, page 3-338, further states, "[a]ll red crossings that are on roads designated to remain open will be prioritized on a forest level to determine the appropriate management plan. Limited funds are allocated by Congress for this purpose, and will be appropriated according to priorities across the forest." The road funding over the last few years has been decreasing for the Alaska Region Forest Service. As a result of limited funding, there is no guarantee that the red culverts on these roads would be "fixed" when prioritized against other red culverts or road maintenance issues in the Forest.

A table has been added to the project record, which is being used to aid in prioritizing culvert remediation. This table assigns each "red" crossing a Biological Significant Indicator (BSI) score based in part on amount of habitat upstream, process group, stream gradient and pool frequency of this habitat and the "barrierity" of the crossing. Barrierity is the degree to which the culvert impedes passage. The higher the BSI score, the more rationale for remediation. This rating does not include cost of remediation which is obviously an important consideration. This is a first cut at prioritizing culverts for replacement.

This project will not cause the repair or replacement of any red culverts to occur at a later date than scheduled. It is routine for road work to occur concurrent with other activities.

Fisheries: Red Culvert Locations

Commenters have requested that the FEIS disclose where all red culverts are on a map, in road and unit cards, and to determine how each one of the roads in which a red culvert is on will be used for the Big Thorne project.

“The “commenter” suggests that all red culverts in the project area be mapped and presented in the FEIS with watershed and subwatershed boundaries displayed, along with roads categorized by existing open roads, new roads, or roads for reopening. Such information may encourage or promote examination of logistics relative to road construction, reopening work associated with the action alternatives being considered, and ideas to remedy red culverts.”

“Please consider and disclose exactly how each red culvert in the project area will be used for this timber sale — i.e. The number of culverts on stored reconditioned roads, currently open system road, open system road slated for storage, etc. Please also include red culvert information on road and unit cards, and in watershed maps. This information is necessary for several purposes, such as cumulative watershed impacts, analysis of Clean Water Act permitting needs, and consideration of effects on transportation. The red culvert location and survey information ought to be readily available, and if it is not then that is an issue that requires correction.”

Forest Service Response:

A map of red culvert locations within the project area will be referenced in the Big Thorne Fisheries Resource Report and made available as part of the project record. Some of the culverts in question are already slated for removal as part of the Prince of Wales ATM decision (2009) while others will be addressed through the on-going forest priority process as existing red culverts in the project area are not the responsibility of the Big Thorne EIS. For more information, please refer to Table 24 in the Fisheries Resource Report (pages 73-80) to see the status by alternative for each red culvert within the Big Thorne project area.

Fisheries: Road Location and Stream Crossings

Commenters have expressed concern that not all BMPs will be implemented on the reconstructed roads (specifically BMP 14.2; assure that water resources protection is considered when locating roads and trails) and that not all proposed road locations sought to minimize road stream crossings.

“On a project level, as discussed in more detail in the watershed avoidance section (cross-ref), we do not believe this project has adequately sought to minimize the number of roads crossing wetlands, including streams.”

“Please consider specifically whether this BMP is implemented on reconstructed roads. Past road locations may or may not have been appropriate. Road card and unit maps indicate many areas where roads to be re-built encroach onto riparian areas of fish streams.”

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Forest Service Response:

Wetlands were avoided to the extent practicable when designing road locations. Wetlands are widespread throughout the project area and occur on gentle slopes. Roads are often located on forested wetlands to avoid traversing on steep ground that may have the risk of adverse effects to downstream resources. Details on how wetlands were avoided can be found in the unit and road cards.

All proposed road locations are selected to balance environmental and economic considerations while adhering to the Forest Plan and the resource management objectives of the proposed project. Further, all proposed road locations are surveyed on the ground to verify stream crossing locations and appropriate site specific soil stabilization and drainage requirements.

The location of road alignments can be limited by numerous factors such as fish streams, beaver dams, wetlands, topography, and highly vulnerable karst terrains. In rare cases, new roads have been built to avoid these resources (3000000 road near Little Ratz Harbor); however, in most cases, the use of existing roads and stream crossings or the reconditioning of an existing stored road will cause the least amount of total disturbance and potential erosion. Existing roads will be upgraded with appropriate BMPs to prevent high energy/channelized flows into adjacent stream buffers and riparian management area. All proposed roads will be considered for random selection of a subset of roads to be included in the annual Forest BMP implementation and effectiveness monitoring program.

See responses to Wetlands: Wetland Avoidance, Transportation: Temporary roads as temporary fills, and Transportation: Road monitoring requirements – Project Related.

Fisheries: Stream Temperature

Commenters have expressed concern that the DEIS did not discuss in detail the extent to which high stream temperature affects fish populations in the project area and that the DEIS did not use the most recent published data on the relationship of past and future timber harvest, blowdown, and the size of buffers and stream temperature. The FEIS should include a comprehensive discussion on the relationship and the potential impacts on fish due to high stream temperature, low stream flows, and timber harvest.

“Our scoping comments requested that the DEIS should disclose the extent to which high stream temperatures pose significant risks to fish populations in the project area. Past Forest Service data and more recent information indicate significant temperature related impacts on fish populations in the project area and in adjoining VCUs.”

“Also, the DEIS should include a comprehensive discussion of the relationship between timber extraction, low stream flows and high stream temperatures. Please assess whether there is a predictive relationship between timber harvest and high stream temperatures.”

“The assessment of the relationship between timber harvest and stream temperatures should consider the adequacy of the riparian buffers. While riparian buffers can clearly moderate stream temperature effects, there is a significant

scientific consensus that a 100 foot riparian buffer is not sufficient to entirely remediate the direct effects of logging on stream temperatures.”

“Consequently, the discussion should include consideration of micro-climate, unbuffered streams and the scale of timber removals. Published empirical data using comparable prescriptions does show a predictive effect between timber harvest and stream temperatures.”

“We pointed out in our appeal of the 2008 TLMP Amendment that stream temperature monitoring throughout the state has indicated repeated temperature exceedances throughout the state. Stream temperature monitoring is relatively inexpensive and sufficiently accurate for forestry applications. We request that the Forest Service implement a stream temperature monitoring program as part of this project.”

“We also request updated information in light of the heavy blowdown characteristic of the project area. The DEIS should assess streamside blowdown in previously harvested areas.

Forest Service Response:

The DEIS discloses and discusses likely direct and indirect effects of past riparian harvest on stream temperatures (DEIS pages 3-281). Supporting scientific literature from Gomi et al 2006 shows the interplay of riparian buffers and the effects on water temperature. The Stream Temperature Monitoring Report 1997-2002 Prince of Wales Island (Walters and Prefontaine, 2005), represents the best available information for the project area.

Attempts to correlate stream temperature exceedances with extent of both riparian harvest and total watershed harvest for available Prince of Wales Island data were not statistically significant. The Effectiveness of Best Management Practices for Water Quality, (Forest Plan Monitoring Aquatic Synthesis, Tongass National Forest), Progress Report further discusses additional progress on stream temperature monitoring on Prince of Wales Island (2004 to 2006): "We found that at least two unmanaged watersheds routinely exceed State-established maximum stream temperature thresholds." Stream temperature at the project level was considered and analyzed. Given what's been done by the Forest Service to date on Prince of Wales Island, we believe additional stream temperature monitoring is not essential to making a reasoned decision about the Big Thorne Project.

The indirect effects to fish from stream flow and temperature change as a result of logging activities were identified and addressed in the Fisheries Resource Report (pp. 61-63 and Table 21). The primary conclusion is that effects to fish from this association would be minimal since the number of affected streams (Class IV in stands less than 15 years of age) is relatively low when compared to the overall number of stream miles in the project area.

The Timber and Silviculture Resource Report pages A-1 to A-6 lists the windthrow risk ratings for each potential harvest unit. Table 7 of this report shows that there are 27 rated as low risk, 152 units rated as moderate risk, and 66 rated as high. Pages 14-16 of the report also discuss windthrow trends in the project area and how the wind risk ratings were determined. Chapter 3 of the DEIS, pages 3-421 to 3-423, explains the direct and indirect effects of the proposed harvest prescriptions on windthrow risk. The DEIS, page

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3-422, explains that where even-aged management is prescribed, exposed stand edges would have increased risk of windthrow in the first few years following harvest but this risk dissipates with time as stand edges stabilize and the harvest areas regenerate. The interdisciplinary team evaluated each stream buffer in light of the overall windthrow trends of the project area along with the wind risk ratings, which take into account the past windthrow history evident in the stand structure of each unit. Where concerns were noted, specific measures were developed to minimize risk. These included instructions regarding the location of unit boundaries to mitigate windthrow, recommendations for Reasonable Assurance of Windfirmness (RAW) buffers and adjustments to unit design and harvest prescriptions. Additional steps were implemented in the FEIS to further reduce risk. These included changing logging systems from cable to helicopter for higher risk RAW areas. This allows for more flexibility in the selective harvest of particularly high risk trees where blown down could trigger more extensive damage. Legacy areas were also repositioned where possible to co-function as additional buffer along streams.

When blowdown occurs along streams, the primary concern is with sedimentation and not necessarily stream temperature increases. This is because windthrow in buffers or along harvest edges is seldom if ever complete, but most often just small patches or groups of two or three trees. The drainage patterns, moderate climate, and heavy precipitation in Southeast Alaska do not lend to situations where stream temperature increases as a result of potential buffer failure are of particular concern.

Forest Plan: Amendment to the Forest Plan

Several commenters had suggestions for amendments to the Forest Plan.

“The re-imposition of the roadless rule has further reduced the acreage of economic timber available under the 2008 TLMP, and we suggest that you incorporate a TLMP plan amendment to make available all of the commercial timberland within the sale area in order to help overcome the economic deficiencies in the 2008 TLMP.”

“We urge you to adopt changes to the 2008 TLMP that would make it possible for your agency to prepare and offer sufficient timber volume to restore and support a viable, fully-integrated manufacturing industry – around 360 mmbf annually, which is only about two-thirds of what Congress promised our industry in the 1980 ANILCA compromise.”

“We request that the Forest Service rescind this DEIS and re-start the scoping process because of the failure to analyze and disclose the significant amendment to the 2008 TLMP that would occur through implementation of Alternative 3.”

“Further NEPA documentation should also discuss whether or not the Tongass National Forest has considered whether it is adopting a significant amendment to the 2008 TLMP through implementation of this project. Rey’s “Letter of Direction” incorrectly assumed that “[n]one of the direction is outside of the Record of Decision.”

“The February 9, 2011 scoping letter provided no indication that the Forest Service intended to designate areas previously reserved for wildlife to timber production

land use designations. The DEIS also fails to acknowledge that these changes are significant.”

Forest Service Response:

The Tongass National Forest is currently conducting a 5-year review of the Forest Plan and asking for comments from the public on whether the 2008 Forest Plan is working as intended, or whether some changes are needed. A public website <http://www.fs.usda.gov/detail/tongass/home/?cid=stelprdb5367364> has been specifically set up for obtaining and processing this information.

Scoping is intended to help identify significant issues and alternatives are developed in response to the significant issues. The proposed small OGR modifications under Alternative 3 are in response to the timber supply and economics issue identified through scoping comments (DEIS pg.1-11) and were available for review and comment in the DEIS. Likewise, the modifications of the small OGRs in Alternative 4 were proposed to respond to various wildlife concerns. These modifications were available for review and comment by the public during the 45-day comment period for the DEIS. The comments received will be used by the Responsible Official, who may or may not decide to include any of these modifications in the decision.

Proposed modifications to OGRs are confined to the Big Thorne Project area as described in Chapters 2 and 3 of the DEIS and FEIS. The need for a Forest Plan amendment will be determined by the Responsible Official, depending on the decision. Modifications to small OGRs are assumed to be a non-significant amendment but are monitored annually to assess whether a significant plan amendment is warranted on the basis of cumulative changes. This will be done during the ongoing 5-year review of the Forest Plan. Any Forest Plan amendment must include a determination whether the change is significant or not in accordance with FSM 1926.51 and 1926.52 (Forest Plan p. 5-3).

Forest Plan: Climate Change

Commenters expressed concerns that the Big Thorne DEIS did not adequately evaluate climate change or carbon storage.

“The discussion primarily tiers to TLMP analysis that concluded that climate change effects on the Tongass are uncertain.

“The DEIS Needed to Analyze Forest Carbon Cycling”

“DEIS does not adequately evaluate climate change.”

“The DEIS lacks detailed information about the site-specific impact of forest management on carbon storage and sequestration or climate change.

“The near-term effects of carbon emissions associated with harvest of live trees and biomass consumption cannot be discounted as the Forest Service does in the Big Thorne DEIS. Short-term CO₂ emissions that directly, indirectly, or cumulatively result from proposed forest management are highly significant in the context of efforts to avoid the worst impacts of climate change, and should be treated as such for NEPA purposes.”

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“Furthermore, the Big Thorne EIS must consider the impact of the timing of carbon emissions. There is a critical temporal relationship between present carbon emissions and the future effects of climate change”.

“Every section of the DEIS, including timber economics, should have considered the impacts of our changing climate”.

Forest Service Response:

In accordance with 40 CFR 1502.20, the Big Thorne DEIS climate change analysis tiers to the 2008 Tongass Forest Plan Revision FEIS and ROD, which included substantial analysis and discussion of numerous potential effects of climate change on the resources of the Tongass, and also the potential effects of the alternatives considered in the Forest Plan FEIS on climate change.

The Forest Service's "Climate Change Considerations in Project Level NEPA Analysis" (2009) also provides guidance on how to address climate change in project-level NEPA documents. This document is available on the Forest Service public website at http://www.fs.fed.us/emc/nepa/climate_change/includes/cc_nepa_guidance.pdf

At the project level, perhaps the best indicator of the effects to climate change can be equated to the amount of timber harvested and the amount of road construction. The commenters state that “the DEIS lacks detailed information about the site-specific impact of forest management on carbon storage and sequestration or climate change. This information is knowable and simply was not considered.” While this information may be “knowable,” the FEIS contains enough information about each alternative’s relative amount of carbon storage and sequestration based on the factors mentioned above (level of proposed timber harvest and road construction), that additional detailed information was not deemed essential to a reasoned choice among alternatives. This approach is consistent with the 2009 guidance that states “It is not necessary to calculate greenhouse gas (GHG) emissions for most projects; however, in situations where the responsible official finds the information useful for decision making, such data and conclusions developed through quantitative analysis would normally only be used for comparing alternatives related to direct effects or addressing any applicable regulatory requirements related to GHG emissions.” Additional information related to project level analysis and information related to ongoing efforts on the Tongass to assess climate vulnerability has been added to the Climate Change section of the FEIS.

Multiple documents on climate change were included as attachments to the comment letters. The references submitted contribute to the expanding knowledge base about carbon sequestration and GHG emissions. However, as part of that knowledge base, it is important to consider each study's relevance, assumptions, limitations, and conclusions.

For example, Depro, et al. (2007) compared a baseline harvest rate with "no harvest" and "high harvest/pre-1989" and estimated annual carbon stock changes associated with each for public forestland in the continuous 48 states. The article discusses how forest and carbon management are much more subtle than simply determining how much to harvest, that carbon markets and prices are highly uncertain, and that variation in harvest (up or down) could alter the annual carbon balance in either direction by up to 50 percent. This paper illustrates the continued uncertainties associated with carbon cycle analysis, is

beyond the scope of project level analysis, and is also not relevant in that the analysis excludes Alaska.

Jandle, et al. (2007) provides information about carbon in soil organic matter and mineral soil and discusses how forest management influences the flow of carbon into the soil and avoiding soil disturbance is important in the process of soil carbon sequestration. The article also discusses various uncertainties regarding soil carbon flow and related land management practices. As above, this paper illustrates the uncertainties with carbon cycle analysis and again the information is beyond the scope of project-level analysis. The Forest Plan provides for soil protection through specific standards and guidelines and these measures help retain carbon stored as organic material in the soil. The Big Thorne Project is designed to meet Forest Plan Standard and Guidelines for soil protection.

Keith, et al. (2009) evaluates forest biomass carbon stocks, identifies forests with the highest biomass carbon densities, and considers the underlying environmental conditions and ecosystem functions that result in high carbon accumulation. The Forest Plan FEIS (page 3-13) acknowledges that the Tongass is considered a carbon sink, storing more carbon than is released by natural processes. However, that does not mean that all forests should be left unmanaged. Keith et al. states that “Large carbon stocks can develop in a particular forest as a result of a combination and interaction of environmental conditions, life history attributes....and land use history” meaning that a managed forest can also contribute to large carbon stocks. Combined with the fact that 91 percent of the Tongass’s productive old growth is protected under the Forest Plan (2008 Forest Plan ROD, p. 21), this confirms that the Tongass’s carbon stocks are not being depleted. Keith et al. also states that, “However, construction of a quantitative predictive model inclusive of all factors is complicated by a lack of process understanding....and many interactions and feedback effects.”

Hare and Meinshausen (2006) attempts to answer questions related to how much warming we are committed to and how much can be avoided. This paper is related to global climate. The article also discusses the lack of scientific certainty in relation to key climate system properties, assumed emission mitigation scenarios, and scientific uncertainties in knowledge of climate sensitivity stating, “Lack of scientific certainty in relation to key climate system properties adds a further layer of complexity to the issue.” They also state “It is clear from the analysis here that the ‘feasible scenario warming commitment’ for the period to 2100 depends significantly upon the assumed emission mitigation scenarios. Therefore, transparency is warranted in regard to the token socio-economic assumptions in each mitigation scenario”.

Allison et al. (2009) is also related to global climate. The article centers around changes in land-use associated with the spread of agriculture, urbanizations and deforestation. The Big Thorne Project does not deal with agriculture, urbanization, or deforestation. The issue of deforestation, in the context of Allison et al, focuses on places like the Amazon where they are questioning the sustainability of those land use practices, which is not the equivalent of what is occurring on the Tongass.

The article by den Elzen and Hohne (2008) summarizes emission reduction ranges and discusses how much would have to be reduced by different countries. The authors also address the issue of “baseline” conditions and different reductions scenarios, including

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land use, land use change, and forestry. Depending on the scenarios, and how they are considered, “current land use related CO₂ emissions and projections are particularly uncertain.” It acknowledges that “less stringent reductions in the short term require more stringent reductions in the long term, to reach the same long term stabilization goals.”

Overall the findings related to the above research make it clear that there is much uncertainty about the carbon cycle and GHG emissions and related land management practices do not contradict the information in the Forest Plan, which the Big Thorne DEIS tiers to, or provide reasons to deviate from the course established in the Plan.

The 2009 Forest Service "Climate Change Considerations in Project Level NEPA Analysis" acknowledges climate change is occurring, but that it is "...not currently feasible to quantify the indirect effects of individual or multiple projects on global climate change and determining significant effects of project alternatives on global climate change cannot be made at any scale" (p. 1). Also, it is “not possible to determine the cumulative impact... nor is it expected that such disclosure would provide a practical or meaningful effects analysis for project decisions" (p. 6). A “qualitative cumulative effects discussion could incorporate a summary of local, regional, or national climate change effects" (Id.). In the case of the Tongass National Forest, the Forest Plan provides this more localized discussion.

The Tongass is managing its timber and other resources in a manner that accounts for climate change by protecting 91 percent of the existing productive old growth (2008 Forest Plan ROD, p. 21). This will provide a resilient ecosystem for plants and animals in the face of uncertain climate change (Forest Plan FEIS, p. 3-296).

In its most recent report, the International Panel on Climate Change (IPCC) concluded "[i]n the long term, a sustainable forest management strategy aimed at maintaining or increasing carbon stocks, while producing an annual yield of timber, fiber, or energy from forests, will generate the largest sustained mitigation benefit" (IPCC 2007). There is nothing to indicate that the Big Thorne project area, and the Tongass as a whole, is being managed in a manner contrary to the IPCC's findings.

Additionally, there are other studies happening regionally and nationally addressing climate change. Given the uncertainties about climate change and its effects on forest ecosystems, policy makers and forest managers are reluctant to make decisions or use forest resources to implement adaptation measures for forest conservation and management. Hennon, et al (2012) contend that more systematic investigations that produce well-documented explanations of climate effects on forest ecosystems are needed in order to build the necessary confidence for policy makers and forest managers to intervene.

Ongoing work to develop a dynamic conservation strategy for the long term survival of yellow-cedar in Southeast Alaska serves as an example (Hennon et al 2012). Yellow-cedar decline is thought to be caused, in part, by a changing climate, and specific actions have been implemented at the project level to address yellow-cedar decline.

The Big Thorne DEIS addresses climate change in relation to the decline of yellow-cedar within the project area (DEIS at pp. 3-408 and 3-420 to 421) and additional information has been added to the Timber and Vegetation section of the FEIS related to the yellow-

cedar species composition of the project area, proposed harvest units, and in regenerated past harvest areas. Also see responses Silviculture: Yellow-cedar Conservation Strategy; Silviculture: Yellow-cedar Decline and Impacts to Redcedar; Silviculture: Yellow-cedar Regeneration; and Silviculture: Mitigation Measures for Yellow-cedar pertaining specifically to yellow-cedar.

Yellow-cedar planting is currently scheduled to occur on the Diesel and Slake Timber Sales approved under the Logjam EIS. About 100 yellow-cedars per acre will be planted on about 700 acres in the spring of 2013. Planting sites will focus on the most-advantageous locations where the species is expected to be able to resist decline into the future. The Forest Service is teaming with Oregon State University and Sealaska Corp. on the project to study ways to promote the survival of planted yellow-cedar. A Categorical Exclusion was signed for this planting project in April 2013.

The Big Thorne Project will consider planting yellow-cedar in even-age management units. Refer to the Timber and Vegetation section of the DEIS (pp. 3-423) and the Timber and Silviculture Resource Report for more information. District and research scientists will work together to identify opportunities to assist the movement of the species to sites where the long-term survival is likely.

Specific resource analyses in the DEIS considered climate change. See Wildlife and Subsistence pages 3-164 and 3-165, Issue 4 Cumulative watershed effects on page 3-266, and timber and vegetation on page 3-408. Also see the Incomplete and Unavailable Information section in the DEIS on page 3-11.

Forest Plan: Falldown

The commenter would like the Forest Service to disclose, evaluate or discuss the environmental and social impacts and the degree to which falldown will occur in implementing the Big Thorne Project. The commenter felt that the difference between the acres and volume planned for harvest in the Big Thorne DEIS and what would actually be harvested in the ensuing timber sales is a significant issue.

“Given this project's emphasis on economic stability and providing a stable, long-term supply of timber to local mills, and past performance, especially in the recent Logjam timber sale, SEACC raised "falldown" as a significant issue in this planning process.”

“Fall down is the shortfall between the number of acres and volume of timber planned for logging and those actually logged. Without explanation, the Forest Service chose not to disclose or evaluate this significant issue in the DEIS, even though NEPA requires it to discuss the relationship between the short-term uses of man's environment when a project is implemented and the maintenance and enhancement of the environment's long-term productivity.”

“Without this analysis, neither the public nor decision maker can evaluate the economic viability of project alternatives or objectively evaluate the economic benefits associated with particular alternatives. Falldown is likely to be most prevalent in places like the Big Thorne project area which has been subject to multiple entries over more than 70 years.”

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Forest Service Response:

The difference between planned volume and actual timber volume offered for sale, or “falldown”, can vary from project to project. The impacts that are projected during analysis are very likely to be less than what actually occurs on the ground. The falldown will be consistent for all action alternatives and will affect their ranking. However, the actual volume will not be known until after the contract is completely harvested since the certified timber cruise is also an estimate of the volume. While much field information has been collected for the environmental analysis, usually the timber harvest units are not completely defined, on the ground prior to the analysis for the DEIS due to the amount of time, money, and personnel that it would take and the uncertainty as to which units would be selected in the decision. Field reconnaissance review of the areas scheduled for harvest by the Forest Plan LSTA may find some acres do not have sufficient volume to be considered suitable timber, and some areas will prove too costly to road or are otherwise uneconomical.

During the development and analysis of project alternatives, every reasonable effort is made to make the best estimate of potential timber sale harvest volume and acreage. This includes evaluating differences in past projects and utilizing that knowledge to refine our future estimates. As with any project, there will be changes that could occur between the planning phase and implementation. The Forest Plan Standards and Guidelines will be followed and applied to any resources found during implementation in the same manner as the ones identified during analysis.

The differences between planned harvest volumes from the Selected Alternative and what is being offered for sale are evaluated in a change analysis prior to the implementation of any timber contract to determine if changes in the project design made during the implementation process warrant additional environmental review. The change analysis process is covered in Forest Service Handbook 1909.15 Environmental Policy and Procedures Handbook Chapter 10, Environmental Analysis, Tongass Supplement 1909.15-2009-1.

When falldown occurs, it can be the result of additional resources being identified that require protection according to the Forest Plan Standards and Guidelines. If any effects have changed, such as the through the identification of additional streams in the unit, these are addressed in the change analysis.

Historically, falldown has been both a Forest Plan issue and a project issue. During the analysis of the 1997 Forest Plan and the 2008 Amendment, Forest Planning models were used (FORPLAN and Spectrum, respectively) to determine acreages to be harvested for the planning horizon. This information was used to estimate timber volume outputs and the effects to other resources for the environment’s long-term productivity. Adjustments in the model were used to attempt to estimate falldown. These adjustments, called Model Implementation Reduction Factors (MIRFs), were included in the Forest Plan modeling as discussed in the Forest Plan Amendment FEIS, Volume II, Appendix B. These constraints are designed to accommodate for unmapped unsuitable lands that were missed during the suitability determination (Forest Plan, Appendix A). Efforts were made to come up with the most accurate estimates possible at the Forest Plan level to reduce the amount of falldown. These constraints forced the model to never harvest a certain

percentage of the acres in the model to mimic the amount of acres from the suitable land base that would be actually harvested.

Forest Plan: Management of Phase 2 lands

Commenters provided various suggestions about the management of Phase 2 lands - whether to manage these lands more intensively, or that the decision should not include those units along the 3016 road since the area is biologically sensitive.

“4. Implement the following Forest Plan amendments (per Chapter 5) at the Big Thorne Project level: ...

b. Modify the Timber Sale Program Adaptive Management Strategy to reallocate all roaded Phase 2 land base acreage within the project area as Phase 1 land base.”

“The DEIS discloses that 3 VCUs are in the Phase 2 area, without identifying which VCUs are referenced...but does not show the public precisely where the Phase II lands are on a map, and which specific units are in these 3 VCUs.”

“The areas that the “commenter” has concerns with are in VCU 5780, a Phase II area. The TNC/Audubon Ecoregional Assessment identifies VCU 5780 as a Priority Conservation area because of both salmon and terrestrial wildlife values. We suggested in our Big Thorne scoping comments that because of these values the harvest activities in this area should be focused on partial harvest prescriptions with minimal temporary road building.”

“... it looks like the units on Phase 2 lands include units 62-87 and 380-392. These units are located in a biologically sensitive area and have been somewhat controversial in the past, especially units 380-392 along the 3016 road. Of greatest concerns to us are Units 83 and 84, which serve as an elevational migration corridors, between previous clearcuts. Although the small patch and strip cut prescriptions for the two units under Alternative 4 are better than the other alternatives, see DEIS at 3-168, these corridors are particularly critical and should be dropped completely from the selected alternative.”

Forest Service Response:

Phase 2 areas refer to the Timber Sale Program Adaptive Management Strategy adopted by the ROD for the Forest Plan Amendment. (See the Forest Plan ROD for a discussion of the Adaptive Management Strategy.) This strategy was designed to restrict timber harvest to a certain portion of the land base until a larger land base is needed to supply timber (see Figure 1, Forest Plan ROD, p. 65). Phase 1 included most of the roaded base and some lower-value IRAs. Phase 2 is predominantly assigned to moderate-value IRAs; however, some roaded portions were included. Some roaded areas adjacent to the Honker Divide OGR complex were considered to be more environmentally sensitive than other roaded areas, and were assigned to Phase 2.

Phase 2 areas allow harvest while in the Phase 1 timeframe for “Personal use of timber, micros sales, salvage sales, small commercial timber sales generally less than 1 MMBF. This allows for additional timber to support the local mills around Thorne Bay and other mills interested in these types of timber contracts. Because of the limitation of the amount

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of harvest and the benefits of this harvest, no modification to the designation of the Phase 2 lands were considered for this project.

All action alternatives include units within Phase 2 areas in varying amounts as discussed in Chapter 3, Issue 1 of the Big Thorne FEIS. Only Alternative 3 includes units along NFS road 3016000. Whether these units will be part of the Selected Alternative will be considered at the time of the decision.

Phase 2 information has been included in the unit card narratives where applicable and will be identified on the ROD map.

Forest Plan: Multiple Use Goals

Several commenters expressed concern that timber harvest was given more focus than other resource uses.

“The DEIS needs to explain how the decision to implement a long-term project is consistent with the multiple use and fair competition policy goals established in the TTRA and the NFMA.”

“The project area is also a multiple use resource area for local residents that depend on area food resources. But the project area has been prioritized for only one use, logging, from the pulp mill days until now. A Big Thorne ten year sale does not balance multiple uses, it adds to the imbalance.”

Forest Service Response:

NFMA requires Forest Plans (not projects) to "provide for multiple use and sustained yield of the products and services" obtained from the National Forest System (16 U.S.C. § 1604(e)(1)). Multiple use management is a deceptively simple term that describes the enormously complicated task of striking a balance among the many competing uses to which land can be put, including timber, watershed, wildlife, fish, and recreation. This "balance" was achieved through the allocation of Tongass National Forest lands to various LUDs (along with the standards and guidelines and management prescriptions for those LUDs) and with the Forest-wide standards and guidelines that provide additional protection by resource. The Forest Plan ROD includes a discussion on balancing "the multiple uses and resources of the Forest," and identifies how different resources such as fisheries, recreation and tourism, timber demand, etc. were considered in striking that balance (see, for example, 2008 Tongass Forest Plan ROD, pp. 15-18).

Forest Plan: Timber demand and export

A commenter is concerned that the market demand calculations for the Forest Plan were inflated due to current Regional policies regarding foreign market export of harvested timber.

“Another tactic for making up for artificially-inflated regional market demand has been to allow round log export for up to half of the timber sale volume... This allowance for export is at odds with the purported agency goal of prioritizing timber resources for local rural community employment.”

“...if half the BTP sale volume...get instead, exported to the Orient, this agency can then prepare twice as much timber sale volume, claiming it is seeking to meet market demand.”

Forest Service Response:

The annual demand calculation is based on many items (Alexander, 2008). Annual demand is based on volume under contract, mill capacity, long-term demand estimates, and the mix of species harvested and sawn locally, in addition to other factors. Exports affect the annual demand calculations in opposing ways; negatively in the case of how much wood is sawn locally and positively in the impacts on volume under contract. Domestic prices are still low enough in comparison to export prices that if there were no export allowed, and all volume had to be appraised for domestic sale, the Tongass National Forest would be unable to offer any timber sales due to the requirement that all timber sales appraise positive.

A limited export policy was established in 2007 in an effort to boost appraised values, provide purchasers economic sale opportunities, and provide additional processing options for purchasers of timber from National Forest System lands in Alaska. Since 2007, the R10 Limited Export Policy has continued with modifications that have provided additional options for purchasers. In November 2009, the limited shipment policy was extended to continue providing that option to purchasers of existing timber sales. The policy was also expanded to provide the same option to purchasers of sales that had been previously excluded from eligibility. A foreign market appraisal was established for use on new timber sales to reflect export values for spruce and hemlock. Although slight improvements in the timber economy occurred nationally in 2012, challenges continue for purchasers seeking domestic markets for Alaska timber. Appropriations language preventing the offer of deficit timber sales in the Alaska Region has been carried forward in FY 2013 through continuing resolution. In order to offer the most timber harvest contracts, appraising for export of a percentage of the timber is necessary to obtain a positive appraisal. This allows for the maintenance of a timber industry in Southeast Alaska. This policy has been reviewed annually and was renewed by the Regional Forester on February 20, 2013.

In a continuing effort to encourage and support domestic processing, in 2012 the Regional Forester agreed to review requests to allow increased export of western hemlock and Sitka spruce from sales where an approved export permit was already in place in exchange for purchasers providing an equivalent amount of Alaska yellow-cedar to small business operators who would process the timber locally, and will continue to consider such requests in 2013 on a case-by-case basis.

The R10 Limited Export Policy otherwise remains unchanged for calendar year 2013. The R10 policy provides the following allowances upon Regional Office approval: Limited export of unprocessed western hemlock and Sitka spruce logs, up to 50% of the total sale sawtimber volume, pursuant to direction contained in Regional contract provisions C(T) 8.661#, C(T) 8.662#, and C(T) 4.134. No changes to the export policy for Alaska yellow-cedar and western redcedar have occurred. Very little western redcedar goes outside of the U.S. Some goes to the lower 48 after a purchaser has made an attempt to market it locally per the requirements of contract provision C4.132#. This only occurs

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during market declines for western redcedar. The western redcedar market is very volatile and during the down markets, purchasers cannot economically process this species; therefore, some of it goes to the Puget Sound area.

Forest Plan: Timber supply and demand

Commenters are concerned that the Big Thorne Project does not meet the demand for timber and that the analysis within the Forest Plan for timber supply and demand is flawed.

“The Morse demand methodology mentioned on page A-8 does not actually function as described in the 2000 document.”

“Page A-11 of the DEIS includes a discussion of the failure to provide an adequate supply of timber, but the discussion incorrectly blames the timber famines on ‘a combination of uncertainties such as delays related to appeals and litigation; changing economic factors, such as rapid market fluctuations; and industry related factors such as changes in timber industry processing capabilities.’ Actually, the primary cause of the timber famine is the 2008 TLMP which made a poor selection of suitable, available timberland... The timber famine is not the result of market conditions or industry related factors and litigation has directly affected only some of the small volumes that have actually been offered and sold.”

“The TNF needs to explain how it tested the assumptions underlying the Brackley analysis against an independent analysis of real costs and prices. There is no feasibility analysis to support the surprising assumption of an expanded industry.”

Forest Service Response:

The Big Thorne Project DEIS is a project-level analysis and describes likely effects and trends related to the project area. The Big Thorne Project is only one part of the total Tongass timber program.

The Tongass is obligated by law to seek to meet market demand while taking into account all forest resources. TTRA Section 101 states “...the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle.”

Annual market demand is calculated each year, and this estimate is used as a guideline in setting timber sale goals. This information can be found in the project record and on the Regional public website:

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5349461.pdf.

The planning cycle market demand analysis for the 2008 Forest Plan was completed in “Timber products output and timber harvests in Alaska: projections for 2005-25” (Brackley et al. 2006), and further described in “Timber products output and timber harvests in Alaska: an addendum” (Brackley and Haynes 2008). The interaction between planning cycle demand and annual demand calculations is described in Appendix G to the 2008 Forest Plan FEIS (all pages). The Forest Service is aware of opposing views, and

has responded in Brackley and Haynes (2008) (all pages) and in Appendix G (all pages) and Appendix H (pp. H-26 to H-36) of the Forest Plan FEIS. The Big Thorne EIS is a project-level analysis, and the project is just one component of the total Tongass timber program. This project tiers to the Forest Plan FEIS, which analyzed the timber supply and demand issues on a Forest-wide scale. The demand analyses underlying this project-level EIS are based on the best science available, and have been extensively peer reviewed, and these documents are in the planning record for the Forest Plan. The Forest Plan FEIS (p. 3-510) explains the role of the Forest Plan versus a project plan in meeting the requirements of Section 101 of the TTRA, "...the Plan sets the conditions under which the Forest Service can seek to meet market demand through the cumulative sales of the annual timber sale program over the planning cycle." The Forest Plan makes no final decision to supply timber to meet demand; it creates opportunities to use the forest, but makes no binding commitment to action. The plan establishes areas where commercial harvest is authorized, but not mandated. The Forest Service seeks to meet annual timber demand through timber sales such as the Big Thorne Project. The process of timber sale preparation to the actual sale of timber from the project area takes several years. Making judgments about when to start preparing timber sale projects based on estimates of demand in the future is very difficult. It is no easier to estimate demand for timber than it is to predict the stock market for a given year.

The volume in Pool 1 includes timber that is either under an analysis for the Project Plan (Gate1) or NEPA Environmental Analysis (Gate 2). There is an expectation that some of this timber will be deficit, which is why the Forest Service tries to keep 4.5 times the volume needed in this pool of timber. Many factors are involved with this volume since markets change throughout the life of the analysis. It often takes 5 years or more from the concept of a project to when the sale is appraised. A project that appraises deficit during analysis may become positive with different market conditions or changed circumstances or vice versa. Because of this, some projects with deficit volume are moved through the process especially during alternative development to respond to comments on other resources. Also, at the time of analysis the project is appraised as a whole and not designed into logical timber sales, which could further influence whether the sale is deficit.

Volume under contract information is based on the amount of timber that is under contract. The Forest Service does not try to predict when the timber will be harvested or if a purchaser may request termination of a contract.

The amount of volume for export is not 'slated'. The export policy only outlines what market the timber sold is appraised for (domestic or foreign). Whether the volume actually does get exported or not is up to the purchaser. The amount that has been exported over the past 10 years can be found at:

http://www.fs.usda.gov/detail/r10/landmanagement/resourcemanagement/?cid=fsbdev2_038785.

Supply and demand for timber volume from the Tongass National Forest was identified as Key Issue #2 (Forest Plan FEIS, p. A-5) during the 2008 Forest Plan Amendment. See additional details about market demand, and the effects of exports on market demand in the Forest Plan ROD, pp. 29-35, as well as "Timber products output and timber harvests in Alaska: projections for 2005-25" (Brackley et al. 2006) and "Timber products output

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and timber harvests in Alaska: an addendum” (Brackley and Haynes 2008). Appendix G of the Forest Plan FEIS provides explanation of how Section 101 of the Tongass Timber Reform Act (TTRA) was addressed and the how the market demand estimation was derived. The discussion in Chapter 2 of the Forest Plan FEIS explains how the range of alternatives for the Forest Plan Amendment responds to resource concerns. See the Forest Plan ROD for a description of how timber production is balanced with other resource considerations.

Forest Plan: Viability of wolves on the Tongass National Forest

Several commenters had concerns about the viability of the Alexander Archipelago wolf.

“The 2008 Forest Plan FEIS failed to accurately model deer habitat for assuring that the Tongass timber program would not impinge on subsistence use of deer and on wolf viability. The error is that the cumulative impact analysis failed to include the acreage of Non-NFS lands in the calculation of deer carrying capacity in the WAAs. This results in significantly over-estimating deer carrying capacity and under-estimating impacts of past and future logging.”

“We note that this is a wolf viability issue as well as a subsistence issue. The DEIS is inconsistent with ANILCA, NFMA, NEPA and APA.”

“There are serious threats to the viability of wolves on Prince of Wales Island and the project area, as many discussions above indicate. There is an active ESA petition to list the wolf as threatened or endangered.”

“This project area already exceeds the number of road miles optimal for deer and wolves, and the plan propose to build even more roads. Wolves and deer would suffer from fragmentation, and additional roads could result in more hunting and trapping pressure, along with more poaching, especially regarding wolves. The TLMP Conservation Strategy Review states that “illegal killing of wolves and deer will make it difficult to regulate harvests unless access is controlled.”

“The DEIS failed fully & fairly assess cumulative impacts to deer, deer predators and hunters, and failed to comprehensively consider ramifications of those impacts. For reasons discussed in the sections above, the DEIS has failed to fully, accurately and fairly discuss the topics of impacts to deer specifically, to prey availability for wolves and hunters. Even had the DEIS analyses of those topics been adequate, the Conclusion sections for each (DEIS at 3-170, 185 and 3-241 to 243) lack a thorough perspective and are not to the point of what impacts can be expected and the importance of those impacts, and used biased, misleading wording.

Forest Service Response:

Population viability is addressed at the Forest Plan level to comply with NFMA. The 1982 Forest Service planning regulations directed that “fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area” 36 C.F.R. §§ 219.19, 219.27(a)(6). For planning purposes, a viable population was defined as “one which has the estimated numbers and

distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.” *Id.*

The viability of the wolf population has been addressed in the 2008 Forest Plan Amendment FEIS, Volume 1 (p. 3-284 and 3-285) and in the decision for the Amendment (p. 20). NFMA requires forest plans to "provide for multiple use and sustained yield of the products and services" obtained from the National Forest System (16 U.S.C. § 1604(e)(1)).

To meet this viability requirement for the Forest Plan, the Tongass relied in part on the findings of structured viability risk assessment panels, consisting of subject matter experts. The panels assembled for the 1997 Tongass Forest Plan concluded that it is highly likely that viable and well-distributed populations of wolves would be maintained through 100+ years of implementing the Selected Alternative of the 1997 Forest Plan (1997 FEIS p. 3-406). These same panel assessments were used for the 2008 Amendment of the Forest Plan. The decision was again assigned a high likelihood of maintaining viable well-distributed wolf populations (2008 FEIS p. D-81).

To address habitat and sustainability on a Forest scale, the Forest Service has identified a system of old-growth reserves to support viable and well-distributed populations of old-growth associated species (Forest Plan FEIS, p. 2-3). In 1993, an interagency committee of wildlife biologists was commissioned to identify species sensitive to modification of old growth and to make recommendations for habitat conservation measures for the revision of the Forest Plan that would maintain viable and well-distributed populations (Suring et al. 1993). Now known as the VPOP committee, their recommendations became the cornerstones of the Tongass Conservation Strategy. This strategy is based on a network of old-growth reserves as well as measures (i.e., standards and guidelines) that apply outside of the reserves. The committee made species-specific recommendations where needed. An integrated old-growth conservation strategy was developed to provide old-growth habitats in combination with other non-development LUDs to maintain viable populations of native and desired non-native fish and wildlife species and subspecies that may be associated with old-growth forests (Forest Plan FEIS, pp. 3-174 to 3-175). The Forest Plan decision (ROD, p. 15) states that the Conservation Strategy ensures the maintenance of long-term viability for wildlife species by means of a comprehensive approach based on principles of conservation biology.

The Forest Service also specifically incorporated the requirement to maintain viable populations into the standards and guidelines. *See* 2008 Forest Plan at 4-89 (WILD1.II.B) “Provide the abundance and distribution of habitat necessary to maintain viable populations of existing native and desirable introduced species well-distributed in the planning area (i.e., the Tongass National Forest).” Specific standard and guidelines were added to address wolves. *See* the 2008 Forest Plan at 4-95 (WILD1.XIV). Standards and guidelines that promote deer habitat capability in the matrix and limit road densities, and planned level of timber harvest would have a high likelihood of maintaining viable and well-distributed populations of wolves. One of these provisions directs the Forest Service to:

Provide, where possible, sufficient deer habitat capability to first maintain sustainable wolf populations, and then to consider meeting estimated human

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deer harvest demands. This is generally considered to equate to the habitat capability to support 18 deer per square mile (using habitat capability model outputs) in biogeographical provinces where deer are the primary prey of wolves.

Falling below 18 deer/mi² does not in itself imply viability concerns for wolves. The above standard and guideline was designed to maintain equilibrium populations of wolves and deer while also providing for a sustainable harvest of deer by humans (Person et al. 1996). To maintain viable wolf populations under the Forest Plan, the VPOP committee recommended that a deer density of at least five deer/mi² be maintained in areas where deer are their primary prey (Suring et al, 1993, p. 33). This is well below the standard and guideline of 18 deer/mi². In addition, both the 1997 and 2008 Forest Plans disclose that deer density, as measured using habitat capability model outputs, in a number of WAAs may fall below the standard after full implementation of the Forest Plan (Table 3-111, USDA 1997, pp. 3-77 through 3-79 and Table 3.10-9, USDA 2008, p. 3-284) and that the deer density in many of these WAAs is naturally low because of poor deer habitat.

In these areas, wolves may persist on other prey such as mountain goats, moose, salmon, beaver, and bear (Person et al. 1996). This information was taken into account as part of the wolf viability panel assessment conducted in 1997, which concluded there is a high relative likelihood that wolf populations would remain viable and well-distributed even with gaps in wolf distribution caused by locally low deer populations or high harvest of wolves (see Iverson 1997 for a more detailed discussion). They agreed that interactions between wolf population centers would continue with only slight and insignificant limitations due to a gap of the size of a pack home range (roughly 100 mi² or the size of a typical WAA). They did not agree on the definition of well-distributed wolf populations, but did agree that the combined implementation of the large old-growth reserves that serve as source populations of wolves, Forest Plan standards and guidelines that promote deer habitat capability in the matrix and limit road densities, and the planned level of timber harvest would have a high likelihood of maintaining viable and well-distributed populations of wolves.

Although wolf population viability has a high likelihood of being maintained, concerns have been expressed on wolf sustainability. These concerns are at a more localized scale than the viability concerns. The Forest Service is working with other Federal and State agencies to address these concerns. An interagency meeting was held at the USFS Southeast Alaska Discovery Center on April 9, 2013. The purpose of this meeting was to discuss the wolf population sustainability issue on Central Prince of Wales, and specifically the Big Thorne project area. Topics discussed by the group included road/access management, deer habitat enhancement, and pre- and post-treatment monitoring of the thinning sites. Recommendations by the group included closing or seasonal restrictions by gates for roads that access the Honker Divide area, such as Roads 2052000, 3035350, 3035400, 3035500, and 3037700. The Honker Divide area is known to provide refugia for one or more wolf packs that may function as sources of dispersing wolves to help reestablish packs in areas otherwise depleted of wolves by human-caused mortality (Person and Russell 2008, Person and Logan 2012). The group also agreed on several priority sites for commercial thinning treatments that would benefit deer, such as those in the area northwest of Thorne Bay, the Sal Creek, Ratz Harbor and Little Ratz

Harbor areas. The group also recognized that actions beyond the scope of the Big Thorne Project may be meaningful to wolf management at the scale of GMU2 or smaller (i.e. the biogeographic province). The interagency group will continue to evaluate these measures and also others such as including development of season and harvest limit proposals for submission to ADFG Board of Game and Federal Subsistence Boards; and development of a wolf habitat management program, which including road access management in conjunction with ADFG. The Forest Service will continue to work with ADFG and USFWS as part of a technical working group to fill information gaps and evaluate potential conservation measures identified by the group that initially met October 2011.

Hydrology: Acid Rock Drainage

Some commenters were concerned with acid rock drainage generation from road construction, cut-bank development, and quarry development.

“According to the DEIS there are 254 miles in the project area of existing road likely constructed from Descon Formation. This can result in the formation of Acid Rock Drainage (ARD), which negatively impacts water quality. “It is not known if material sources used in this construction contain mineralization” (at 3-256). The DEIS seems to dismiss the possibility based on a personal communication with the Forest Geologist that “no past problems had been “observed”, yet provides absolutely no basis for this claim other than apparent anecdotal observation. Has any base line monitoring been undertaken on these 254 miles of existing roadway? If so, please disclose the results.”

“Your agency seems to have a rather cavalier attitude toward the issue of ARD in the project area. Instead of identifying and avoiding the areas altogether you propose mitigation. The only mitigation I could find, in the case where mineralized rock is exposed, is a proposal to “line the upslope ditch with limestone aggregate to neutralize run-off from potential mineralized zones exposed during full bench construction”. Are such measures consistent with the CERCLA water quality recovery plan? At what rate will the aggregate be applied and will it result in full cessation of ARD into the future, or is this measure only a temporary stopgap? Who will monitor application of the aggregate? Why will aggregate be applied only to the upslope side of the ditch when mineralized rock will likely be exposed under the road bed and on the downhill side as well? Will the ARD sites be monitored into the future? Please disclose your monitoring plan.”

Forest Service Response:

The commenter’s concerns stem from the situation that developed during the construction of a portion of the Coffman Cove 3030 Road. Material was quarried from a very highly mineralized shear zone within the Descon Shale and placed within the groundwater table where acid rock drainage (ARD) developed. The amount of mineralization within this shear zone was localized. If the quarried material had been tested to determine ARD potential before use, the risks would have been apparent and development of ARD could have been avoided. Nearly all lithologies within the project area contain disseminated pyrite and other sulfide mineralization. The presence of disseminated mineralization does not generally create a threat of ARD development either in the natural state or in road

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construction. The key is to identify areas with significant mineralization without buffering capability and to insure that these outcrops are not used for road construction materials. Once the potential material sources for the project area are identified, the Forest geologist will sample each of the sites. The collected samples will be sent for analysis. Any material source in which the test results show the possibility of acid production will not be used in road construction. The map on page 3-303 clearly shows the known outcrops of the Descon Formation. Potential material sources within this rock type will be tested for acid accounting as will other material sources that show disseminated mineralization.

One comment pointed out that “subsequent testing of the waters above the Coffman Cove Road cleanup effort” currently show some “metal values exceeding Alaska Water Quality Standards suggesting mineralization exists in other areas within the project area” (3-429). This is true. Some background values do exceed Alaska Water Quality Standards in their natural state. This does not mean they pose a threat to the natural systems they are a part of.

As a result of the Coffman Cove Road ARD problem, the question arose as to whether other long-established Forest roads were showing similar ARD symptoms. Over the course of several days, the Forest geologist reviewed historic roads constructed from the Descon Shale looking for the indicators of ARD. None were found. Subsequently, inventories associated with the road condition surveys where many parameters were noted were searched. Out of the thousands of culverts in the project area, five metal culverts were described as showing weathering but none were corroded due to acidity being generated from the road construction. The apparent lack of similar ARD problems with other Forest roads is believed to be related to overlay-type road construction (not a burial of material) and the application of generally neutral or non-acid producing bedrock for construction.

New road construction may encounter mineralized zones in any of the lithologies within the project area. For the most part, these are generally less than a few feet wide, so their profile in the cut-slope or ditch line should be minimal. If larger mineralized zones are encountered which when tested show the potential for ARD development, then mitigation such as placement of carbonate bedrock in the ditch may be necessary. Road construction will be inspected by the engineering representatives and the Forest geologist notified when warranted. Design and implementation of any appropriate mitigation will be the responsibility of the engineering representatives and the Forest geologist. Culverts are monitored on a scheduled timeframe, so while all culverts would not be checked each year, they will be checked several times in the next 10 years.

Additional information has been included in the FEIS (Issue 4, Chapter 3) and the project record regarding the effectiveness of proposed ARD mitigation and the status of the streams affected by the Coffman Cove Road ARD.

Hydrology: Alternative 5

Commenters have expressed concern that Alternative 5, created to address watersheds concerns, is misleading because it harvests old growth timber that is beneficial to watershed function and does not include additional mitigation measures that would better-mitigate watershed impacts.

“It is misleading to characterize an increase in old-growth harvest as responding to watershed objectives. Old-growth forests are beneficial to watershed function, and cutting more would work against the purported objective of this alternative.”

“Alternative 5 also does not include additional mitigation measures or alternatives that would be less environmentally damaging for watersheds. As indicated in our comments on roads, there are many obvious steps (such as pulling all drainage structures) that would better-mitigate watershed impacts”

Forest Service Response:

Alternative 5 includes commercial thinning units in older young-growth stands where thinning could improve watershed function, benefit wildlife, and contribute to harvest volume. Given these primary considerations, this alternative attempts to maximize timber supply but does not adjust OGR boundaries, limits road building, proposes fewer new stream crossings, proposes limited harvest and employs helicopters in timber removal. Alternative 5 meets the purpose and need of this project while implementing Forest Plan goals and objectives. Additional information has been included in Chapter 2 of the FEIS and the project record to clarify some of the qualitative design elements of Alternative 5 that address watershed concerns. Further, the Design Criteria and Mitigation Common to all Action Alternatives section (Chapter 2) outlines the measures that will be taken to protect watersheds and mitigate any negative effects resulting from implementation of this alternative.

Hydrology: Clean Water Act and Northwest Environmental Defense Center (NEDC) v. Brown ruling

There were comments that the Forest Service is bound by the decision in the NEDC litigation and that the DEIS incorrectly states that because the Forest Service was not a party of the litigation that it does not apply. In addition the road network's current condition is in violation of the Clean Water Act and the Forest Plan S&Gs because runoff from the roads is transporting sediment directly into streams. Therefore, the Forest Service should identify, analyze, and mitigate all locations of sediment discharges from area logging roads and determine if roads need a NPDES permit.

“The DEIS wrongly suggests that, because the Forest Service is not a party to the NEDC litigation, the holdings do not apply to it, and leaves the issue at that. This is incorrect. The decision is binding precedent, and it is the province of the judiciary, not the executive branch, to say what the law is. The uncertainty is in the general regulatory realm of CWA permitting of logging road point source discharges. This factor applies more-or-less equally to all timber harvesters in the country.”

“In addition to the legal significance under the CWA, the TLMP S&Gs require that discharge from road ditches “should be cross drained to filter on natural forest floor, rather than flowing directly into streams.” TRAN4.II.A.8. This reason is independent of the stormwater permitting rule, and is a further rationale why the EIS needs to, at minimum, identify and seek to mitigate all locations where forest road ditches drain sediment directly into streams.”

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“Moreover, given the condition of the current road network in the Tongass National Forest, runoff from existing logging roads is occurring in violation of the CWA. The Forest Service should focus on compliance with the CWA by removing or altering existing roads to minimize such sediment discharge rather than expand the scope of its violation with new road construction.”

“The DEIS needs to consider the extent to which this project may violate the Clean Water Act by relying on prospective, uncertain mitigation measures.”

Forest Service Response:

We agree that NEDC v. Brown and related court rulings (e.g., Decker v. NEDC) had potential implications for logging roads on National Forests. In response to NEDC v. Brown, EPA revised its regulations to clarify that a National Pollutant Discharge Elimination System (NPDES) permit is not required for stormwater discharges from logging roads. The Supreme Court recently upheld EPA’s policy.

All applicable Forest Plan Standards and Guidelines, Forest Service Manual and Handbooks and BMPs will be incorporated during design, construction and maintenance of roads. All Big Thorne timber harvest roads are constructed and maintained for silvicultural purposes, and will apply the practices described in BMP 12.5. Therefore, they meet the criteria for a silvicultural exemption from permitting under the Clean Water Act Section 404. The Tongass has 20 years of BMP monitoring data and that data shows a high rate of BMP implementation. Recent data has been summarized and shows 98.6 percent full BMP compliance on roads and harvest units over the last 5 years (Draft 2012 Tongass National Forest Annual Monitoring & Evaluation Report) The DEIS identified known erosion and maintenance needs of the project’s existing roads, and new road maintenance needs have been identified through additional Watershed Improvement Tracking road surveys that were conducted. The FEIS and the Watershed Resource Report have been updated with this additional information and the surveys have been placed in the project record.

Hydrology: Falls Creek

One commenter expressed concern about the lack of stream data from Falls Creek and requests that additional stream surveys be conducted and the FEIS should more fully describe how the proposed activities may contribute to the existing condition.

“According to the DEIS (page 3-265), “PFC and Tier II surveys were conducted on one reach in the Falls Creek subwatershed in 2001. The surveyed reach was determined to be ‘not functioning’ due to past riparian harvest, constriction created by an existing bridge, lack of riparian vegetation, lack of LWD and pools, and bank instability and erosion. “Since additional timber harvesting and road construction are proposed within this subwatershed under all the action alternatives, the Final Environmental Impact Statement (FEIS) should more fully describe how the proposed activities may contribute to the existing condition in Falls Creek. Additionally, new stream surveys should be completed to determine if the “not functioning” condition of the single reach that was surveyed in 2001 is indicative of the condition of Falls Creek as a whole. If it is, then Falls Creek should be prioritized with other future restoration projects.”

Forest Service Response:

The Falls Creek reach in question was determined to be “non-functioning” as a result of a combination of factors, primarily the constriction created by the existing bridge. Human activity near bridges likely contributed to the lack of vegetation and large woody debris (LWD). This reach would likely be considered “functioning” had the bridge not been constructed. This is substantiated by a proper functioning condition (PFC) assessment described in USDA Forest Service 2006a and Beard 2011, which is referenced in the project Watershed Resource Report. These PFC assessments describe Falls Creek as a “functioning” watershed. Given that the overall assessment of Falls Creek is “functioning”, the nonfunctioning condition of the stream reach in question represents a localized condition and is considered a separate matter from the Big Thorne EIS. This anomalous impact would not influence the proposed alternatives of the Big Thorne Project.

Hydrology: Forest Plan Standards & Guidelines

One commenter expressed concern the Big Thorne Project is not complying with the Forest Plan because there is proposed harvest and road building along stream reaches or in subwatersheds or watersheds that are not properly functioning.

“Please more carefully consider how TLMP S&Gs can be met, when an already degraded landscape is being further hammered. For stream reaches, subwatersheds, and watersheds that are not properly functioning, additional harvest and roading should be foregone in order to comply with the TLMP.”

Forest Service Response:

The Forest Service recognizes the impacts from the proposed action and identified cumulative watershed effects as one of four significant issues for the Big Thorne Project. The existing conditions of the watersheds are factored into decision-making with regard to design of alternatives which are protective of watersheds even though they may have been previously impacted. All of the watersheds within the project area have been rated using the USDA Watershed Condition Framework and none were listed as “not properly functioning”. Regardless, some watersheds are more at risk than others in the project area and the proper implementation of Forest Plan Standards and Guidelines will be an important factor with any of the action alternatives. The effects analyses for Issue 4 and Fisheries (particularly the stream habitat, LWD, and Essential Fish Habitat sections), presented in Chapter 3 of the DEIS and FEIS, explain how riparian no-harvest buffers and other BMPs would minimize effects on stream habitat and large wood supply in accordance with Forest Plan Standards and Guidelines.

Hydrology: Peak and Low Flows

One commenter expressed concern that the DEIS did not address possible changes in peak and low flows and the timing of water release into streams in its analysis.

“The DEIS fails entirely to evaluate possible changes to low flows, focusing instead entirely on potential changes to peak flow. However, diminished low flows are a significant habitat issue for winter rearing habitat, and high stream

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temperature issues in summer. Where forested wetlands provide a buffering function for stream-flows, cutting and roading wetlands can result in flashier flows with less water left over for low-flow periods. The issue here is not water yield, but rather the timing of water release into the stream. A roadbed would shed all water instantly, whereas the wetland it replaces may have been a sponge that released cold water slowly during dry periods. Please consider this issue in the EIS.”

“Cumulative effects of wetland loss deserve more careful attention. The wetland, watershed, fisheries and transportation sections are all integrally related. The wetlands analysis should be cross applied and perhaps joined with the watersheds discussion. The effect of so much of the natural wetland being logged and roaded is surely a factor relevant to analyzing increased peak flow, and water temperature, for example. With regard to peak flow, the DEIS recognizes that an effect of removing forest canopy over forested wetlands is increased precipitation reaching the ground, and lower evapotranspiration. DEIS at 3-358. Yet wetland alterations are not accounted for in the separate section on peak flow.”

“In the Final EIS, please analyze wetland impacts on a watershed scale, as well as the project area scale. Please also encompass those findings (e.g. percent of wetland converted to road) into analysis of watershed and fishery impacts.”

Forest Service Response:

The DEIS focuses on potential peak flow response. The Watershed Resource Report considered potential low flow changes, but concluded they were not a significant issue for the Big Thorne Project EIS. Analyses cited in the DEIS and FEIS (USGS 2000) and Watershed Resource Report (e.g., Bartos 1989) consider the possibility of low flow effects in Stanley Creek on Prince of Wales Island but conclude that the signal is weak (USGS 2000) and could be interpreted as increases, not decreases (ibid, Bartos 1989). Additional evaluation was completed in 2010 (USGS 2010) and concluded that climate trends have masked any discernible changes in streamflow resulting from timber harvest (ibid). The FEIS and Watershed Resource Report have been edited to clarify this issue and correct citations. Almost all studies in the Pacific Northwest have focused on peak flow effects. Grant et al 2008 (page 18) state that “small watershed studies represent the best and in many cases the only means of quantifying the effects of forest practices on streamflow.” We acknowledge a need for additional study and research into this issue. Streamflow effects will be extremely difficult to ultimately resolve given a number of limitations including disentangling the effects of multiple vegetation and road management treatments (including young-growth thinning) that overlap in both time and space, along with potential effects attributable to climate change (Grant et al. 2008). The FEIS acknowledges uncertainty with respect to the effects of timber harvest on stream flows. The decision maker will consider these factors when making his decision.

We are unaware of studies in the PNW or Alaska that are able to state that the percentage of wetlands in the watershed changes the peak flow response from timber harvest. It may be a reasonable assumption that substantial wetlands store water and could buffer streamflow response to timber harvest. However, the level of detail (analyzing wetland loss by watershed) is not warranted based on the existing literature. Synergistic effects

could not be displayed and would not change the effects conclusions or the comparison of alternatives. Watershed response studies in the PNW and SE Alaska have included variables at a coarser scale than wetland percentage, like bedrock geology.

The increased precipitation hitting the soil surface and reduced evapotranspiration is an effect not unique to wetland soils and thus would not warrant a separate peak flow analysis. Nor is a separate analysis justified for water temperature. Soil water tables are high enough in forested wetlands that the dominant vegetation species consist of hydrophytic vegetation. Slight changes in the water table can further slow plant growth as disclosed in the FEIS wetlands section.

Hydrology: Road Effects

Commenters have expressed concern that the DEIS did not discuss in great depth how decommissioning and storage of new and reconstructed roads would reduce road effects from construction nor how flow paths can be reclaimed with the methods of road storage proposed for the Big Thorne project. They ask that the FEIS discuss in more detail the effects on streamflow, sediment, and turbidity.

“The DEIS states that, “Decommissioning of temporary roads and storage of any new and reconstructed system roads would reduce sedimentation effects of road construction” DEIS at 3-274. Please discuss this issue in greater depth in the FEIS.”

“The DEIS says road effects on streamflow, sediment and turbidity “may not recover until flow paths are reclaimed during road decommissioning” DEIS at 3-272. However, road closure methods such as are proposed here do not in fact recover flow paths. This is particularly true where roads cross forested wetlands, and where drainage structures are left in place.”

“Additionally, the sedimentation and hydrology impacts of roads are linked, in that the hydrology impacts on sedimentation impacts. The Draft EIS segregates these issues.”

“Two weaknesses of the DEIS consideration of turbidity are, (1) the site-specific impact of turbidity is entirely ignored, and (2) it does not address cumulative impacts of turbidity exceedences, in combination with other sedimentation, temperature, peak flow, fish passage and other issues.”

“Moreover, it is important for the purpose of producing scientifically integral analysis to account for effects of concentrated water flow through buffers over time, particularly if road construction activities intercept ground water.”

“Forest roads are a chronic source of soil erosion and sediment production in forest waters (Gucinski et al. 2001).²⁰⁴ The extent, location, and effects of road construction, including contribution of roads to stream bank erosion, runoff channelization and suspended sediment, as well as cumulative effects to aquatic habitat, should be considered a significant issue in the project analysis.”

Forest Service Response:

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The DEIS and FEIS Chapter 3 Issue 4 discussion acknowledges and addresses the effects of roads on water quality, streamflow, and watershed condition. All roads continue to have some effects, even when stored or decommissioned. This is why all roads are considered in the affected environment and cumulative effects discussions of Issue 4.

Refer to the DEIS and FEIS Chapter 3 Issue 4 Sediment and Turbidity sections for discussions that link the effects of extended stream networks to road-generated sediment, road connectivity to streams, and road density. Road effects on streamflow are considered in the Streamflow sections.

The DEIS and FEIS Chapter 3 Issue 4 Sediment and Turbidity sections cite relevant turbidity monitoring efforts in the Tongass National Forest (e.g. Thompson 2002, Tucker and Thompson 2010). Based on these data temporary, localized increases in turbidity (and sediment) are acknowledged, but are expected to be similar to what occurs during storms and return to natural conditions within a couple of days. The DEIS and FEIS acknowledges concern for cumulative watershed effects throughout discussion of Issue 4 and Fisheries section (e.g. DEIS Table WTR-11, Table Fish-6).

The process of storing a road to vehicle traffic and placing it in a condition that requires minimum maintenance is done to protect the environment and preserve the facility for future use. A range of methods is used to store or decommission roads depending on site-specific conditions and other factors. Effects of roads on resources are reduced through application of standards and guidelines and BMPs. BMP 14.20 (FSH 2509.22) states “Maintenance Level 1 roads are maintained to protect the road investment, adjacent land and water resources. When vegetative closure is used, implement measures to assure that water bars, culverts and other road drainage structures will continue to function without the benefit of routine maintenance.” The extensive methods used for erosion control and prevention of sediment delivery to water bodies including road storage and decommissioning, as outlined in the Forest Plan Standards and Guidelines, is incorporated in the Watershed Resource Report by reference. Specific areas and roads where road storage, decommissioning or maintenance is needed to are listed in the Watershed Resource Report and road cards. (See DEIS at page 3-273.)

Hydrology: Road surface area in watersheds

Commenters have expressed concerns over the existing and proposed road densities that exceed 2.5 percent, especially Ratz Harbor, Salamander Creek, Slide Creek, Torrent, and Thorne River Intertidal subwatersheds. Many feel there is an increased risk to sedimentation that may have moderate effects on water quality.

They are further concerned the DEIS seems to contradict itself by drawing the conclusion that increased risk and moderate effects on water quality would not degrade water quality or fish habitat and the DEIS did not consider in detail the cumulative effects of road density on fish habitat, peak flows, and water quality at the subwatershed scale.

Commenters request that the FEIS analyze the cumulative effects of road densities on fish habitat, peak flows, and water quality and take into account past management activities when analyzing risks and potential effects to down-slope resources.

Commenters have requested that all Big Thorne management activities be deferred until the road network is decreased by decommissioning and the road density is below 2.5 percent.

One commenter asked that the Forest Service drop or modify its conclusion about potential sedimentation and effects on aquatic habitat from increased road densities because there is no evidence that salmon returns have declined and in some cases parts of Southeast Alaska have seen increased returns.

“Because of these findings and the existing high road densities and large number of stream crossings, new road construction within the Ratz Harbor, Salamander Creek, and Slide Creek subwatersheds should be deferred until after the existing road network is pared down to densities below 2.5 percent of their respective basin areas through road decommissioning. This could be accomplished by delaying the proposed Big Thorne management activities within these subwatersheds until later in the 10-year project implementation period to allow this decommissioning to be completed first.”

“The DEIS admits that, even allowing for mitigation, there “may be increased risk of sedimentation” due to roads, and within those subwatersheds with over 2.5% of their basin in roads sediment accumulation it “would be probable” and have “moderate effects on water quality.” DEIS at 3-274. Yet in the very next breath the DEIS draws the abrupt (and contrary) conclusion that this is “not expected to degrade water quality or fish habitat.” The Forest Service is drawing a conclusion that is directly contrary to the available and admitted facts. Numerous detrimental effects to fish habitat and water quality are known to follow sedimentation. Numerous streams in the project are suffering in degraded condition as a result of past sediment impacts.”

“Please consider the subwatersheds and watersheds that exceed the 2.5% threshold, or are otherwise of concern, in detail. This threshold is exceeded in Deer Creek, Ratz Harbor, Salamander, Slide Creek, Thorne River Intertidal, and Torrent subwatersheds. DEIS at 3- 258; 3-260 (Table WTR-4). Importantly, cumulative effects must be considered at this scale, because this is the scale on which impacts (including cumulative impacts), occur.”

“Chapter 1 of the DEIS states a concern that “The proposed action combined with past timber harvest would increase the percentage of each watershed area covered by timber harvest and would increase road densities in each watershed, potentially resulting in higher rates of sedimentation and/or other effects on aquatic habitats.” There has been no decline in fish returns in Southern Southeast Alaska and the most heavily logged areas in Southeast Alaska have seen an increase in salmon returns. This suggests that the Forest Service timber sale program has been well managed in the past and there is no reason to believe that continuing the agencies past harvest and regeneration plans for the project area will result in any harmful sedimentation and/or other harmful effects on aquatic habitats (not all sedimentation, stream temperature increases or other effects are harmful; some are

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beneficial). We urge you to modify or drop statement about harmful road densities.”

Forest Service Response:

The 2.5 percent road density concept (described by Cederholm 1980) provides a way to evaluate the potential impacts of roaded area in the affected subwatershed. It is simply a unit of measure that can help guide Forest Service management decisions, but is not mandated by the Forest Plan to trigger alternative harvest prescriptions. In general, potential sedimentation effects to habitat increase with an increase in road density. However, as stated in the DEIS, a statistical relationship between fine streambed sediment and watershed disturbance has not been reported in Southeast Alaska studies (Bryant et al. 2004, Woodsmith et al 2005). The DEIS disclosed potential effects at logical subwatershed and watershed scales. The Forest Service expects that BMP implementation (as supported by BMP monitoring results cited in the DEIS) will minimize effects and prevent water quality degradation. Temporary, localized water quality effects are allowed as long as BMPs are used. By definition these effects are not considered water quality degradation.

The road density calculations used for watershed effects in the DEIS are based on all roads (including temporary roads that have already been decommissioned). Future road would not reduce this number, since it reflects an absolute maximum of cumulative road area.

Cumulative effects are discussed in both the Fisheries and the Watershed Resource Reports. The Big Thorne EIS is not required to analyze effects at the subwatershed level, but in certain areas this has been done in the resource reports.

See Hydrology: Peak and Low Flows section above for additional discussion on stream flow analysis.

The FEIS has been updated. None of these subwatersheds are above the *20 percent harvest and roads since 1981* threshold, but they do exceed the *2.5 percent basin in road* analytical threshold.

Fine sediment accumulation in streams would be a concern. Although a statistical relationship between fine sediment in streams and watershed disturbance has not been reported in Southeast Alaska studies (Bryant et al. 2004; Woodsmith et al. 2005), according to the analytical threshold selected for this project, road construction and reconstruction in these subwatersheds could have moderate effects on water quality compared to other subwatersheds in the project area.”

Hydrology: Stream Flow

Commenters have expressed concerns about proposed harvest in several watersheds and subwatersheds that would achieve hydrologic recovery in 20 or less years and recommend that all proposed units and roads be dropped from all alternatives. Commenters have expressed concern that the DEIS did not adequately analyze cumulative effects in regards with the proposed harvest in each of the watersheds that will exceed the 20 percent threshold and may impact fish and wildlife habitat, and they believe that the Forest Service should be focusing on restoring the watersheds.

Commenters have questioned why the Forest Service did not use the Distributed Hydrologic Vegetation Simulation Model (DHVSM) or the Regression Analysis that was used in Kahklen & Hartsog (1998) to determine peak flows and sediment transport rates.

“Finally, it reopens the Upper Steelhead, Cobble, and the Boy Scout watersheds for logging that could recover full hydrologic function if left alone for 20 more years.”

“Lastly, we question the wisdom of reopening the North Big Salt Lake and Tolstoi Bay Frontal Clarence Straits watersheds under any of the alternatives. As noted in the DEIS, “[i]f no further harvest occurs in these watersheds, they would reach a state of hydrologic recovery, based on forest canopy, by the mid-2020’s.” DEIS at 3-253 , 254. We recommend dropping all proposed units and roads from these watersheds in the selected alternative.”

“The DEIS fails to take a hard look at the cumulative impacts to fish and wildlife habitat from the action alternatives. One approach to the question of cumulative impact is temporal. This project area has been heavily logged in the past, contains an extensive legacy road system, and every waterway has been degraded by human activity to one degree or another. A careful and thorough analysis would have examined not only each of the roads and units proposed in each of the alternatives, but the cumulative impacts from previous logging activities.”

“The “commenter” encourages the USFS to avoid new development activities that will impact salmon streams or cause them to exceed environmental thresholds identified in the Tongass Land Management Plan (TLMP). As identified in the DEIS, multiple subwatersheds within the project area already exceed standards identified in TLMP for the amount of harvest area and the amount of roaded area. DEIS at 3-252 to 3-253 and 3-258 to 3-260. Additional subwatersheds have been identified as having a high potential for sediment impacts to aquatic resources. DEIS at 3-258. The USFS should avoid any new logging activities that will cause or exacerbate exceedances of the 20% standard. It also should avoid any road construction or reconstruction if the activity will increase or cause new exceedances of the 2.5% standard.”

“Why not use the Distributed Hydrologic Vegetation Simulation Model (DHVSM), which has proven useful in predicting changes in peak flows due to forest roads and may be the best approach? Why not use the regression analysis to predict sediment yield to streams from roads, used in Kahklen & Hartsog (1998)?”

Forest Service Response:

Concern over the acres of harvest in the Big Thorne Project area and for the watersheds listed is noted. Hydrologic recovery due to regrowth of vegetation in harvested areas is expected to require between 10 and 30 years (James 2012). We acknowledge that the metric is sensitive to watershed size (as watershed size increases, harvest per unit area is likely to decline). Nonetheless, the watershed sizes (and potential effects) are within the range of those considered by many of the studies cited in the DEIS and FEIS.

The threshold approach used in the analysis is not based solely on Bosh & Hewlett (1982).

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The 20 percent detection threshold is a cautious approach to minimizing or avoiding effects based on the body of peer-reviewed literature addressing the topic of timber harvest effects on streamflow in the Pacific Northwest--most notably, Grant et al (2008) and others mentioned in the DEIS (page 3-252) and in the Watershed Resource Report (James 2012).

The percent watershed harvest in a 30-year period threshold and the 2.5 percent watershed roaded threshold used for analysis are not Tongass Land Management Plan Standards or Guidelines.

For reasons including those cited by Coe (2004), studies in the Pacific Northwest have produced highly variable results. Predictive models cannot be developed because baseline streamflow data is only sparsely available in Southeast Alaska and unavailable in project area watersheds. The credible use of models developed elsewhere (including DHSVM) would require a major effort in field calibration that is beyond the scope of this project. To our knowledge, DHSVM has not been applied in Southeast Alaska and would require a substantial investment in time and funding to calibrate it to the project area. For example, an application of DHSVM to a watershed in Interior British Columbia (Whitaker et al 2003) required detailed hourly meteorological data from an array of elevations throughout the watershed. These data are simply not available for any watersheds in Southeast Alaska.

Kahklen and Hartsog (1998) provide a useful tool for evaluating road-generated sediment under various conditions in Southeast Alaska. The Kahklen and Hartsog model also includes several variables (traffic, slope, and slope-length), typically not available for analysis of road segments at the project scale. Specific existing sites and road segments that have known erosion concerns are identified in the Watershed Resource Report.

Hydrology: North Big Salt Lake watershed

While commenters agreed with the Forest Service strategy to limit annual harvest levels within the North Big Salt Lake (Steelhead Creek) watershed some have expressed concerns that the DEIS discussion on the benefits spreading the harvest over time is lacking, especially on the benefits to fish.

“To mitigate this concern, the Big Thorne project will incorporate a harvest entry timing strategy within this subwatershed to ensure that the 20 percent/30 year threshold is not exceeded. According to the DEIS (page 2-11), "In order to minimize any effects of harvest on streamflow in the North Big Salt Lake (Steelhead Creek) subwatershed, annual harvest levels will be limited to ensure that less than 20 percent of the subwatershed is in previously harvested areas that are 30 years old or younger at any point in time. To do this, harvest will be limited as follows:

- Up to 151 acres can be harvested in 2015 and no harvest is allowed prior to 2015;
- Up to 226 additional acres can be harvested in 2016 (plus any remainder from 2015);

- Up to 114 additional acres can be harvested in 2017 (plus any remainder from 2015 and 2016);
- Up to 171 additional acres can be harvested in 2018 (plus any remainder from 2015, 2016, and 2017);
- No limitation in 2019 or later

The DEIS (page 3-269) indicates, "Delaying and staggering harvest between 2015 and 2019 would provide enough forest regeneration to minimize any potential for increased peak flows within the subwatershed " The State agrees with this strategy for the Big Thorne Project."

"The DEIS considered delaying harvest in subwatersheds in order to time things so as not to go above 20%.¹⁶⁷ However, the Draft EIS does not explain the benefits of spreading out harvest over time in order to remain below (or limit the exceedence) the 20% threshold. What is the benefit to fish of spreading out harvest over time, versus logging it all now?"

Forest Service Response:

The threshold of no more than 20 percent in a 30-year timeframe is based on findings documented in Bosch and Hewlett (1982), and other studies from the Pacific Northwest, such as Jones (2000). The threshold is relevant because it indicates the potential for change in stream flow resulting from cumulative watershed harvest. Table 1 (pg. 1) of the Fisheries Resource Report lists one of the issues/concerns for exceeding this threshold is that change in stream flow can negatively affect fish rearing and spawning habitat. The Fisheries Resource Report discusses the effects of increased sediment in streams to fish and fish habitat. As part of mitigation common to all action alternatives, the Forest Service proposes to stagger harvest in the Steelhead Creek subwatershed to avoid exceeding this threshold, thus minimizing effects to fisheries resources. More discussion on stream flow and percent canopy coverage can be found in the Fisheries Resource Report.

Hydrology: Watershed Analysis, Cumulative Effects, and Insufficient Information

Commenters have expressed concern that there is information lacking in the DEIS on streamflow, sediment quantities, transport rates, and stream surveys and request that a comprehensive watershed analysis be done when there is an absence of baseline data.

Commenters stated that a watershed analysis should have been prepared as required by Appendix C to the Forest Plan to make an informed decision. They state that without such detailed analysis, the Forest Service failed to take the hard look required by NEPA. They state that a watershed analysis is necessary in order to fully review aquatic habitat impacts and that the DEIS failed to take a hard look at the various factors that must be incorporated into the cumulative effects analysis.

"According to a Forest Service study, "[r]esponsible stewardship requires a working knowledge of sediment quantities, transport rates, and routing from

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roaded areas to the channel system in order to effectively predict and limit impacts of road construction operations on erosion and sedimentation in the forest ecosystem.”¹⁵⁵ This information is lacking in the project area.”

“There is no baseline stream flow data available. DEIS at 3-254.”

“The project record contains MacDonald (1991) Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. However it is not clear that these guidelines are being followed. There appears to be a knowledge gap at No Name subwatershed, where there are no ADFG data, and no USFS field or RCS data. See Knutzen 2012 (Table 7).”

“Our scoping comments requested that you undertake additional late-season verification of stream class boundaries between class II and class III streams located within timber unit boundaries.”

“Cumulative watershed impacts should be considered on both a watershed and stream reach scale.”

“We request that you provide a comprehensive watershed analysis and include any existing baseline data in the DEIS. We think it is incumbent on the agency to do so particularly if there is an absence of baseline data.”

“The TLMP directs the Forest Service to conduct watershed analyses in cases where there are multiple risks to fish in the watershed. Because of the level of past development in this area, the likelihood of increased sediment yield risks or erosion potential, and the high density of existing and proposed roads along with past maintenance problems, we request a full watershed analysis be conducted as required by the TLMP. The narrow scope of the watershed analyses done for the DEIS does not include the relevant factors necessary to adequately identify, evaluate and disclose the direct, indirect and cumulative effects of logging on watershed functions, resources and uses as required by the APA, NFMA, the Clean Water Act and NEPA.”

Forest Service Response:

The literature cited in the Aquatics section of the DEIS and in the Aquatic Resource Report documents the effects of timber harvest and road building on various parameters related to hydrology and fisheries resources. Most studies referenced occurred in the Pacific Northwest or British Columbia, Canada, due to regional similarities in climate, physical and biological conditions, and harvest histories. In addition to citing the most relevant studies for the proposed project, watersheds within the project area were analyzed in some detail in the DEIS and Watershed Resource Report. The DEIS provides direct, indirect, and cumulative effects of the proposed activities using quantifiable measures. Refer to DEIS page 3-269 for descriptors of effects and acknowledgement of data gaps and uncertainty.

The Forest Plan does not require watershed analysis unless Riparian Standards and Guidelines are modified or public water supply is involved. The FEIS has been clarified to explain that no public water supply source areas would be impacted by the project. Nonetheless, a field-based assessment was completed and the DEIS presents a thorough

effects analysis under Issue 4: Cumulative Watershed Effects section. The application of BMPs and standards and guidelines during layout, implementation, and maintenance will maintain water quality and limit in-stream impacts for all alternatives. Special attention is given to verification of fish streams and upper limits of fish habitat as depicted on unit cards and updated during sale preparation as needed. Additional documentation of field surveys is available in the project record. This will avoid compromising spawning and rearing habitat which supports anadromous and resident fish populations. All watersheds are expected to continue to support anadromous and resident fish populations and maintain water quality into the future, regardless of which alternative is selected.

The effects from the Big Thorne Project on subsistence fish are summarized in Chapter 3 of the DEIS under Issue 3: Wildlife and Subsistence Use. Please see the Fisheries Resource Report (pages 23-28 and page 55) for a full discussion of the effects on subsistence fish.

All field data collected was available in a reasonable time frame to completely analyze for effects to watersheds and aquatic habitat for the DEIS and FEIS. We agree that we must use the best information we have at the time, and the FEIS and Fisheries Resource Report have been updated to reflect any new information collected.

Karst: Caves

A commenter has expressed concerns of effects on karst and caves.

“The FS has already cut way too much timber from CPOW. Keep what's left for small operations and forget cutting like the good old pulp mill days. Also, CPOW is full of caves and karst. The FS has already screwed the karst up way too much on POW.”

Forest Service Response:

All caves and significant caves, karst features, and the lands that drain to them within the Big Thorne project area have been removed from consideration of timber harvest. The remaining areas underlain by soluble bedrock, limestone in this case, have been found to be of low or moderate vulnerability to the proposed timber harvest. Appropriate mitigation if needed has been applied in these areas.

NEPA: Relationship with the State of Alaska

The commenter believes that more explanation of the relationship of the Forest Service with the State of Alaska agencies, especially in regards to planning timber harvest projects, is necessary.

“In the DEIS, the Forest Service has done a wholly inadequate job of describing the State/USFS partnership. (DEIS at 1-9 to -10). Of the several MOUs that are relevant and active, most are not mentioned in the DEIS. For those that are, only an MOU's topic is given, not a summary of the duties and responsibilities they entail.”

“A fact the DEIS failed to disclose about its relationship with the state is the existence of a body called the State Tongass Team (STT), which has had a hand in

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the planning of the Big Thorne project. STT's involvement has included meeting with Forest Service personnel as well as other participation in the project's planning process by the team's members or their subordinates or colleagues."

Forest Service Response:

The Forest Plan Record of Decision is prefaced by a letter co-signed by both the Governor of Alaska and the Chief of the Forest Service called "A Shared Vision for the Tongass National Forest." This lays the groundwork for cooperation between the two agencies.

The DEIS (p. 1-10) does disclose the State's involvement in developing the issues and alternatives. This section has been updated in the FEIS to discuss the MOUs with the State and other coordination. The consultation between Forest Service and the various State agencies has existed before the Forest Plan and continues to evolve and expand. Agency cooperation involves these topics and others: fish passage relating to Title 16, concurrence with the State Historic Preservation Officer (SHPO) regarding the results of heritage surveys, interagency review of old-growth reserve designs for wildlife, and the development and monitoring of the best management practices (BMPs) for the protection of soil and water resources. Findings as required by law will be discussed in the Record of Decision. All relevant MOUs with the State are in the project record for the FEIS.

NEPA: Information from the Alaska Department of Fish & Game

A commenter believes the Alaska Department of Fish and Game withheld information for this project.

"Certainly, the State has a right to its political opinion, but it is unconscionable for the State to withhold biological information so that only one side of the story is told in timber sale EISs. The Forest Service was notified of the problem when we described it in detail in our appeal of the Tonka timber project decision this Spring. The Forest Service should not have completed the Big Thorne DEIS until it made an energetic effort to obtain the missing information, reconsider the project in light of it, and incorporate it into the relevant resource analyses for the DEIS."

"Within Southeast Alaska, often the best expertise (or a substantial portion of it) on place specific wildlife and fish matters resides within ADFG. Certainly, the State has a right to its political opinion, but it is unconscionable for the State to withhold biological information so that only one side of the story is told in timber sale EISs." "It is required that such information be available to citizens before a decision is made, and that is the purpose of a DEIS. A supplemental DEIS is necessary for Big Thorne to provide and analyze the missing information and provide the public an opportunity to comment on the project in light of it."

"The planning record demonstrates that the Forest Service failed to make reasonable efforts to induce the State to provide the information it has, to provide access to experts, and to allow the experts' opinions to be quoted in the DEIS."

"The State was the direct actor in this. But the Forest Service is culpable because it did not make an energetic effort (in fact no effort, as far we can see) to gain

access to the expertise and advice of this uniquely qualified biologist, through its rights under its MOUs and partnership arrangements with the State.”

Forest Service Response:

The Forest Service cannot force or “induce” the State to provide additional information that may or may not exist. The Forest Service is fulfilling its obligations under NEPA by considering the information available to it. Concerns about the activities of another government agency should be presented to that agency for consideration.

All letters received as well as any attached exhibits to comments on the Big Thorne DEIS will become part of the project record. This is not limited to the 45-day comment period which is designed to establish standing for the appeal (36 CFR 215.13). However, it is neither the responsibility nor the policy of the Forest Service to solicit comments from any particular individual for any reason during the NEPA process. The Forest Service has a public participation process that encourages all individuals to provide comments on a project during scoping, at public open houses and when the DEIS is available for comment. However, comments are received outside of these time periods and are considered to the extent possible during the NEPA process.

NEPA: Recommendations for the Decision

Using many of the comments contained in this Appendix as reasons, some commenters support Alternative 1 no action or call for termination of the project; while others support Alternatives 2, 3, 4 and 5. One commenter encourages the USFS to implement a final project that promotes the Tongass Transition by combining watershed restoration, improvements to existing roads and stream crossings, forest-stand treatments, microsales and other timber units that are designed to minimize impacts to fish streams, riparian areas and sensitive wildlife habitat.

“This letter is written in support of Big Thorne EIS. This plan appears to be well-thought out, considers long term effects as well as short term, and prepares for continuity and responsible stewardship rather than immediate results.”

“Overall we believe the EIS strikes a good balance between the need to provide a local, economic supply of timber and the consideration of the various resources and issues identified in the Forest Management Plan, as well as those concerns identified in the scoping process. It will also support the local industry of an area that is dependent on this sector and has extensive infrastructure (sawmills, roads, log transfer facilities, etc.) to extract and process the timber.”

“I support Alternative 2, as it provides the most favorable results that affect me and those in my proximity.”

“The Big Thorne Bay Timber Sale is very important to the people on the Prince of Wales Island. Alternative 2 is option that best suits the needs of the communities and their residents. More roads are needed to access firewood and deer for local subsistence, especially with so many Forest Service roads being water-barred and closed to public access.”

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“Alternative 2 of the Big Thorne Project, best accommodates our needs because it not only offers logging, but also some road work to keep our construction crew working. We prefer old growth forest because the size of the wood better suits our equipment and methods of logging. Alternative 3 provides more timber, however it also opens much more new growth that would require us to invest in different equipment that is not cost-effective at this time.”

“I’d like to voice my opposition to the Big Thorne Timber Sale. I strongly believe this area should be managed for multiple use and that Prince of Wales Island in general has been extensively logged to the detriment of fish and game. As stewards of a resource that belongs to the public, you should be considering all uses for the land, not just industrial logging.”

“We object to planning a timber sale of this size and scope, both in terms of physical impact, and the amount of time.

“Of the five proposed alternatives, I support Alternative 1 (no action). Although Alternative 1 would not meet the stated purpose for the Big Thorne Project, it does meet the stated purpose of the EIS, and does meet the Forest Service Plan Standards and Guidelines for all other resources on Tongass other than logging.”

“It is unbelievable to me that we could be considering a project the size of Big Thorne - or even a tenth of this size - on the Tongass in 2013.”

Forest Service Response:

The process for this project included thorough public involvement at many stages and received an array of diverse comments including recommendations for the selection of various alternatives for the decision or including various parts of alternatives such as the young-growth thinning or modifications of the small OGRs from either Alternative 3 or Alternative 4.

Some commenters support Alternative 1, the ‘no action’ alternative for selection, which the Forest Service takes into consideration. Other commenters stated the size and scope of the Big Thorne Project is too large. The Forest Plan allows for timber harvest in this area and timber harvest is one of the multiple-use goals, along with the protection of other resources.

A small sales alternative was considered, but eliminated from detailed analysis. The Alternatives Considered but Eliminated from Detailed Study section of the FEIS has been updated with additional information related to a small sales alternative. See responses to NEPA: Range of Alternatives and NEPA: Purpose and Need.

NEPA: Public Involvement and NEPA Process

Several commenters had comments regarding scoping and the NEPA process used in the DEIS and/or violations of the NEPA process used on the Big Thorne Project.

“The minimum addition of 1,000 acres of clearcuts to the scope of the project is well outside the range of alternatives suggested in the scoping notice.”

“Table 2.1 is prefaced by a statement that Chapter 3 should be consulted to fully understand the environmental consequences it shows as well as others. However, the statement and the table are an insufficient way of presenting a Comparison of Alternatives.”

“The bibliography you have spent so much time on listing is incredibly antique, obsolete and just plain old.”

“We are pleased that the Forest Service did not select any of the three alternatives that included commercial thinning of young growth, recognizing that this stand treatment is uneconomical for them and the product of little or no value in the current Southeast Alaska market structure.”

“We request that the Forest Service prepare a revised DEIS if planning is to continue on this project.

“The deficiencies are numerous and range from a failure to fully consider species-specific habitat specializations to inadequate surveys and the refusal to obtain watershed baseline data necessary to monitor and mitigate impacts over the extended duration of this project.”

“Further NEPA analysis needs to more thoroughly consider whether the BTP can proceed under NFMA’s mandates to maintain viable wildlife populations.”

“The DEIS fails to take a hard look at the cumulative impacts to fish and wildlife habitat from the action alternatives.”

“Further NEPA documentation should in particular discuss the relationship between a long term timber commitment and U.S. Fish and Wildlife Service listing decisions and court rulings on wolf and goshawk.”

Forest Service Response:

Part of the scoping process is to determine the scope of issues to be addressed, to identify the significant issues related to the proposed action and to help determine the range of alternatives (FSH 1909.15, Chapter 11 -Conduct Scoping).

Compared to the proposed action, Alternative 3, which emphasizes optimizing volume and net return on timber harvest, includes approximately 1,000 acres of additional even-aged harvest. The increase of even-aged harvest is in response to scoping comments related to the timber supply and economics issue, (Issue 1, DEIS page 1-11 and Alternative 3, DEIS Page 2-3).

Regarding Table 2.1, it is designed to provide a comparison of alternatives by the significant issues identified during scoping (40 CFR 1501.7). Additional information, including other resources and comparison measures, pertaining to the effects analysis is found in Chapter 3. Chapter 3 provides detail for each of the quantitative measures (listed in Table 2.1), as well as the qualitative measures and describes what the analysis means to that resource and how it compares to the other alternatives. The level of surveys and analysis was based on the estimated level of effects on a particular species and the need for this information. As explained in the DEIS, p. 3-11, perfect knowledge is not known for many species nor would it be possible to acquire within a reasonable amount of time

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and money (40 CFR 1502.22).

There has been no decision made with the scoping process or in the DEIS regarding the selection of an alternative or whether young-growth thinning will be included. After considering the purpose and need, the environmental effects and supporting analysis in the FEIS, and public comments, the Responsible Official makes a decision. A Record of Decision (ROD) is prepared for this purpose.

For the commenter concerned about the bibliography, the information or references are not considered obsolete as long as they are still valid and applicable to the resource. We feel the references we used are the best available science. The references range from 1964 to 2012. The 1964 reference is a landslide study in Southeast Alaska and is still relevant. The DEIS was published in 2012, so the latest references we used are that date.

The analysis of direct, indirect, and cumulative effects by significant issue and other resources are disclosed in Chapter 3 of the DEIS.

The 1982 Forest Service planning regulations directed that “fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area.” 36 C.F.R. §§ 219.19, 219.27(a)(6). For planning purposes, a viable population was defined as “one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.” *Id.* When preparing the 1997 Forest Plan and 2008 Forest Plan Amendment, the Tongass National Forest evaluated the Forest Plan for compliance with the viability requirements of 36 C.F.R. Part 219.

Population viability is addressed at the Forest Plan level to comply with NFMA. The viability of the wolf population has been addressed in the 2008 Forest Plan Amendment FEIS, Volume 1 (p. 3-284 and 3-285) and in the decision for the Amendment (p. 20). NFMA requires forest plans to “provide for multiple use and sustained yield of the products and services” obtained from the National Forest System (16 U.S.C. § 1604(e)(1)).

To meet this viability requirement for the Forest Plan, the Tongass relied in part on the findings of structured viability risk assessment panels, consisting of subject matter experts. The panels assembled for the 1997 Tongass Forest Plan concluded that it is highly likely that viable and well-distributed populations of wolves would be maintained through 100+ years of implementing the Selected Alternative of the 1997 Forest Plan (1997 FEIS pg. 3-406). These same panel assessments were used for the 2008 Amendment of the Forest Plan. The decision was assigned a high likelihood of maintaining viable well-distributed wolf populations (2008 FEIS pg. D-81).

Chapter 3 of the DEIS has specific section on the effects of the project on a variety of wildlife species and their habitat including deer, wolves, bear, flying squirrels, endemics, marten and birds. See the Fish section for analysis of aquatic species.

The Forest Service agrees that the project will affect goshawks and these effects - direct, indirect and cumulative - are disclosed in the BA/BE. The BA/BE makes the determination “May impact individuals but not likely to cause a trend to federal listing or a loss of viability.”

In August 2011, the USFWS received a petition to list the subspecies of the Alexander

Archipelago wolf as threatened or endangered, and to recognize Prince of Wales Island as a significant portion of its range (Center for Biological Diversity and Greenpeace 2011). The petition also requested that the USFWS consider Prince of Wales Island and adjacent islands (including Kosciusko, Tuxekan, Heceta, Suemez, Dall, and others proximate to Prince of Wales) a Distinct Population Segment based on unique genetic, physical, and ecological characteristics. At the time of this writing, the USFWS is currently conducting a 90-day review of the Alexander Archipelago wolf which will conclude with the determination of whether or not the petition should be moved forward for additional review.

In August 2012 a final goshawk rule was published in the Federal Register that designated the British Columbia Distinct Population Segment (DPS) as Threatened under the ESA, but the Alaska DPS was not listed primarily because of protections afforded by the Forest Plan. This information is included under Issue 3: Wildlife and subsistence use in the DEIS and FEIS.

NEPA: Purpose and Need

Several commenters were concerned with the purpose of this project.

“Although the Forest Service claims to rely on the Tongass Land Management Plan's multiple-resource goals and objectives, it chose to focus exclusively on those goals and objectives associated with extraction of old-growth timber.”

“In further NEPA analysis, the Forest Service should explain how the proposed action - a large-scale project that primarily facilitates processing capacity in distant or foreign communities under the Forest Service's export policies - is consistent with the stated purpose.”

“Instead, the Forest Service proposes logging too much old-growth too quickly and fails to satisfy the broad objectives outlined in the purpose and need disclosed in the project's Notice of intent.”

“This DEIS opted to proceed with but one purpose from the Strategic Plans to the exclusion of other purposes that more accurately reflect multiple uses of the project area”

Forest Service Response:

NFMA requires forest plans to "provide for multiple use and sustained yield of the products and services" obtained from the National Forest System (16 U.S.C. § 1604(e)(1)). Multiple use management is a deceptively simple term that describes the enormously complicated task of striking a balance among the many competing uses to which land can be put, including timber, watershed, wildlife, fish, and recreation. This "balance" was achieved through the allocation of Tongass National Forest System lands to various land use designations (LUDs) which in conjunction with the management prescriptions for those LUDs and the standards and guidelines, provide additional resource direction. The Forest Plan ROD includes a discussion on balancing "the multiple uses and resources of the Forest," and identifies how different resources such as fisheries, recreation and tourism, timber demand, etc. were considered in striking that balance (see,

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for example, 2008 Tongass Forest Plan ROD, pp. 15-18).

The Big Thorne Project is a timber harvest project and was designed to meet the goals and objectives of the Forest Plan with regard to the timber resource. The Forest Plan addresses multiple-use goals and objectives through the allocation of lands to the set of land use designations (Forest Plan, Chapter 3); therefore, multiple-use goals are addressed at the Forest-wide level, not at the level of individual projects. The Record of Decision for the 2008 Forest Plan Amendment describes how timber production is balanced with other resource considerations. This EIS is a focused project analysis and not a programmatic one like the Forest Plan.

The CEQ regulations require agencies to “briefly specify the underlying purpose and need to which the agency is responding to in proposing the alternatives including the proposed action” (40 CFR 1502.13). It is the underlying need that justifies the proposal to take action, authorizes action, and defines the range of alternatives. The Big Thorne Project relies on Forest Plan objectives as a purpose (Forest Plan, p. 2-7). The underlying need is explained in the Big Thorne Notice of Intent, as well as Chapter 1 and Appendix A of the DEIS, in that the timber industry requires an economically viable, reliable, long-term supply of timber to remain a viable part of commerce and an employer in Southeast Alaska. Appendix A of the DEIS explains the obligation to help stabilize the timber industry in the communities of Southeast Alaska.

Additionally, there is no requirement in the CEQ regulations (40 CFR 1500-1508) or NEPA itself (42 U.S.C. 4321 et seq.) to include a broad array of considerations in the underlying purpose and need for project action. Rather, a well-defined purpose and need provides for a more-focused analysis.

NEPA: Range of Alternatives

Several commenters felt the alternatives did not protect fish and wildlife, or did not have enough small sales or did not fit their thoughts for the project.

“Our proposed alternative attempted to enhance long-term rural prosperity and address concerns relating to supporting sustainable jobs in local communities, timber economics, and maintenance and improvement of fish and wildlife habitat. While alternatives 4 and 5 include components of our proposed alternative, they do not reflect all the concerns, in particular minimizing new road construction and decommissioning or storing new system roads upon completion of logging activities.”

“The Range of Alternatives is too narrow. Alternatives that find a middle ground between the no action alternative and the ten year sale alternatives should be part of the process. A small sales alternative can meet the Purpose and Need of the project if designed right.”

“Our scoping comments requested that a broader and more carefully crafted purpose statement that would encourage the development of reasonable, smaller volume alternatives that avoid new road construction and consist solely of small and microsales. We reiterate that at a minimum, the DEIS should have at least included the development of a small and/or microsales alternative.”

“An alternative should be included that would repair all roads used by the project up to standard.”

“Please include consideration of a reasonable range of alternatives with regard to watershed protection.”

“In scoping comments responding to the notice of intent to prepare this DEIS, conservation advocates asked the Forest Service to study, develop and describe a “no-road construction” alternative for the Big Thorne Project. This alternative clearly meets the purpose and need for action, and it is reasonable because it squarely addresses “preliminary issues” of “road management” and “inventoried roadless areas” identified by the notice of intent.”

“Another reasonable alternative that the Forest Service should study, develop, and describe in the EIS would avoid timber harvest on “inherently unstable” forest lands and “sensitive watersheds” identified by prior analysis of forest lands on Prince of Wales Island.”

“It is unreasonable to characterize any of the alternatives as being responsive to wildlife or fisheries concerns. This means that the TNF improperly excluded numerous reasonable alternatives that range from down-scaled timber extraction levels to alternatives that provide a binding mitigation plan for the serious watershed damage already present in the project area.”

Forest Service Response:

The Big Thorne Project was designed to meet the goals and objectives of the Forest Plan with regard to the timber resource. The alternatives were specifically designed to meet the purpose and need for the project and to be consistent with all applicable forest-wide standards and guidelines. The Big Thorne DEIS (Chapter 3) discusses the potential effects of the project on the other resources of the project area.

There are no specific number of alternatives required (36 CFR 220.5e). Alternatives must meet the purpose and need for action and address significant issues related to the proposed action. The range of alternatives should include all reasonable alternatives including those eliminated from detailed study.

Given the purpose and need, the alternatives considered in detail and eliminated from detailed study in the Big Thorne DEIS respond to the significant issues and range in volume from 93 to 233 MMBF. In addition, a no-action alternative, as required in an EIS (40 CFR 1502.14(c)), that would protect all remaining deer winter habitat and old-growth forest was analyzed.

A commenter asked the Forest Service to develop and evaluate an alternative that enhances long-term rural prosperity and addresses concerns relating to supporting sustainable jobs in local communities, timber economics, and maintenance and improvement of fish and wildlife habitat. The commenter acknowledges that Alternatives 4 and 5 incorporated many of their items, but not all. Alternatives 2 and 3 also incorporated several items as well. The alternatives that were developed by the Forest Service for the Big Thorne Project made a concerted effort to meet the purpose of supplying timber (including young growth in three alternatives), while mitigating impacts

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to salmon, wildlife, recreation and tourism, and utilizing minimal road building and road storage and decommissioning of roads used for this project.

A no roads/ minimal roads alternative was considered, but eliminated from detailed study as explained in the DEIS on page 2-13 and 2-14. This alternative was eliminated from detailed study in favor of modifying Alternative 5 to reduce road densities and increase volume relative to the purpose and need through additional helicopter harvest. In the FEIS, new road construction was reduced under all alternatives with the largest reduction of 8.5 miles under Alternative 4. Alternative 4 minimizes road construction with 11 miles of new construction followed by Alternative 5 with 15 miles. The FEIS also reduces the miles of road to remain open by 1.8 miles. Both these alternatives decommission roads after timber harvest and hauling is completed with the exception of system roads that would remain seasonally open for 1-5 years to allow for firewood gathering prior to being stored (FEIS p. 2-14).

To meet standards for timber harvest related use, roads specifically needed to implement the project are subject to pre-use maintenance requirements and are the responsibility of the timber sale purchaser as specified in the timber sale contract. The maintenance and reconditioning of existing roads is an ongoing process that occurs on a periodic basis in the project area and is done through separate service contracts. The timing of this work may occur before, during or after the project (DEIS p. 3-427). See Transportation: Road Maintenance responses also.

The opportunity to offer small sales is specifically addressed and included in Alternatives 2-4 (DEIS p. 2-3 to 2-6). An alternative solely designed on providing timber for small sales was determined not to be consistent with the project's purpose and need, which included a supply of 2-3 years of timber to local mills plus providing shelf volume to promote stability for the timber industry. The same is true for a "no roads" alternative. These alternatives, including a more-volume alternative, were eliminated from detailed analysis as described in the DEIS on page 2-13. Additional information regarding a small sales alternative has been added to the Alternatives Considered but Eliminated from Detailed Study section in the FEIS.

Alternatives 4 and 5 were designed to specifically respond to wildlife or fisheries concerns, while protection of unstable soils are addressed in all action alternatives through Forest Plan Standards and Guidelines for soil and water (Forest Plan p. 4-65). Issue statements in the DEIS on pages 1-12 and 1-13 describe the specific concerns identified through public and agency comments related to various wildlife species and watershed cumulative effects. Alternative 4 emphasizes landscape connectivity and the protection of key wildlife travel corridors and minimizing impacts to wildlife species including wolves, goshawks, black bears, deer and marten (DEIS p.2-6). Alternative 5 reduces harvest in watersheds with high levels of past harvest and minimizes road construction and road-stream crossings (DEIS p. 2-8). Both Alternatives 4 and 5 address wildlife and fisheries issues in a way that exceeds Forest Plan Standards and Guidelines, while still providing timber consistent with the purpose and need of the Big Thorne Project. There is also a no action alternative that proposes no activities that would maintain the area in the existing condition except for other ongoing projects and natural occurrences.

In regard to planning a contract on a decade-long timetable and making timber available

on a more flexible basis, the action alternatives provide for a range of volumes that could be offered under a multi-year timber sales or stewardship contracts. A longer contract period provides more flexibility for the operator has to remove the timber to response to market fluctuations. See Ten-Year Sale response also.

National Direction: Stewardship

Several commenters felt that stewardship projects needed to be connected to the EIS.

“... this sale continues business as normal and does not commit to carrying out any specific stewardship or restoration work in the project area.”

“Given that the Big Thorne Project area is a Designated Stewardship Area, and that using stewardship contracting and applying retained receipts will potentially be a part of the project implementation; we believe that it is appropriate to provide comments on the absence of any discussion of in the Draft EIS.”

“In addition to incorporating restoration activities into the final project, the “commenter” encourages the USFS to avoid activities that will create the need for more riparian and instream restoration work.”

“Although the agency promotes this project as encouraging economic stability and a stewardship approach, the Big Thorne project is all about supplying as much old-growth timber as possible in the short term from a project area that has already seen extensive timber development.”

“We add that further NEPA analysis is necessary on the additional ground that the BTP requires analysis as both a connected and a cumulative action under the CEQ regulations.”

“I object to stewardship projects’ being funded through proceeds of logging old growth timber, and believe that those projects should be funded through direct appropriation. Such funding turns real forest restoration on its head.”

“At a minimum, in order to achieve the Administration’s express transition goal, as part of the proposed action, the USFS should identify, plan, and commit to implement specific stewardship projects that would create jobs while restoring ecosystem function and enhancing forest resources.”

“Furthermore, all proposed alternatives raise concerns with regard to potential salmon and watershed impacts. Should the project move forward, the “commenter” encourages USFS to implement a project that promotes the Tongass Transition. Such a project should include watershed restoration in high-priority watersheds, improvement of existing roads and stream crossings, forest-stand treatments designed to improve large woody debris recruitment and wildlife habitat along with young-growth units, and micro-sales and other timber units that are designed to minimize impacts to fish streams, riparian areas and sensitive wildlife habitat.”

Forest Service Response:

The Big Thorne EIS is a timber harvest project that includes old growth and young-

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growth volume and is part of the Tongass' long term, integrated resource program of work. Stewardship opportunities may be integrated into the Big Thorne Project during implementation using the money from the timber receipts for the timber.

The Forest Service is working on which restoration and maintenance projects may be included in an Integrated Resource Timber Contract (IRTC) along with timber harvest.

These stewardship projects are not directly tied to the purpose and need of the Big Thorne Project and therefore the associated NEPA process is separate from the Big Thorne EIS. The DEIS states that activities will be identified through other planning efforts and the appropriate environmental analysis will be done prior to inclusion in a stewardship contract.

All stewardship activities must comply with NEPA, although multiple NEPA documents may be used for a single stewardship project (FSH 2409.19, 61.1). Regional Office review of stewardship contracting proposals will verify that the activities proposed for implementation have been appropriately analyzed pursuant to NEPA and that the potential cumulative effects of all actions have been considered and disclosed.

Restoration and enhancement projects with a scoped proposed action to initiate the NEPA process will be considered as "reasonably foreseeable" and considered in the cumulative effects analysis of this EIS. This list of projects is included in Appendix D - Part II of the FEIS.

With regard to old-growth timber harvest fitting within stewardship contracting authority, stewardship contracting authorities allow the exchange of goods for services. The timber harvest proposed for the Big Thorne project is designed to meet land management objectives identified in the Tongass Forest Plan and will, regardless of the type of contract used to implement the project, generate a value for the goods (timber) sold. The value of the goods potentially provides a source of funds to accomplish service/restoration activities for which funding may not otherwise be available, at least in the short-term. The value of those goods, under a stewardship contract scenario, will be exchanged for desired service work within the project area under the same contract. If the value of goods (timber), determined by Forest Service appraisal and subsequent bids, exceeds the cost of services in the contract, then the excess receipts may be retained on the forest and used on additional, approved stewardship contracts.

As discussed in the DEIS on page 1-18, Section 323 of Public Law 108-7 granted the Forest Service the stewardship authority until September 30, 2013. This authority allows the Forest Service to enter into stewardship contracts for up to 10 years with private persons or public or private entities, by contract or agreement, "to perform services to achieve land management goals... that meet local and rural community needs." The Act provided a list of land management goals that could be achieved through stewardship contracts, stating:

The land management goals of a project... may include, among other things –

1. road and trail maintenance or obliteration to maintain water quality;
2. soil productivity, habitat for wildlife and fisheries, or other resource values;
3. setting of prescribed fires...;

4. removing vegetation or other activities to promote healthy forest stands... or achieve other land management objectives;
5. watershed restoration and maintenance;
6. restoration and maintenance of wildlife and fish habitat; and
7. control of noxious and exotic weeds and reestablishing native plant species.

The Forest Service Handbook (FSH) 2409.19, Chapter 60, provides policy and direction for stewardship contracting, and states that the "determination whether or not to use stewardship contracting as a tool ultimately lies with the line officer" (FSH 2409.19, 61.2).

The public laws and Forest Service policy referenced above established the authorities for the Forest Service to enter into stewardship contracts, and describes how stewardship contracts are intended to be used. Some of the key components allowed by that legislation relevant to the Big Thorne project are: 1) ability to perform services for accomplishing land management objectives; 2) ability to trade goods for services; and 3) ability to retain receipts in excess of service costs and use them to fund additional service activities.

Three additional key components provided by policy direction in FSH 2409.19 at 60.2, 60.3, and 61.1, respectively are: stewardship contracts are an implementation tool; multiple NEPA documents may be used for a single stewardship contracting project; and the Regional Forester must approve the use of stewardship contracting authority to implement projects.

While stewardship contracting is one of the tools that may be used to implement Big Thorne activities, it is important to note that the decision to do so has not yet been made. The Thorne Bay District has been working with the public through collaborative meetings to identify potential stewardship activities.

Recreation: Tourism and Recreation Economy

A commenter objects to the proposed action because of the effects it may have on recreation, recreational sites, scenic byways, and recreation income. A commenter has requested that more consideration should be given to how the Big Thorne project will affect the non-consumptive user group. Another commenter has expressed that the DEIS failed to take a hard look at how timber related activities impact the recreation economy and new analysis should be done to consider the extent to which the quality of the experience and how it is important for promoting returning visitors.

“Tourism and the visitor industry is a major component of the Prince of Wales economy. The numbers cited by the Forest Service of 12,326 visitors to Prince of Wales Island in 2007, bringing in more than \$30 million dollars in gross revenue, are illustrative of the impact of this economic sector. See DEIS at 3-443. Consequently, we object to the proposed impacts of the proposed action on the Control Lake/Balls Lake/Cutthroat Road/Honker Divide recreation complex. Proposed unit 27 in the Control Lake VCU should not be included in the Selected Alternative.

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This set of recreational facilities has been identified as a vital recreation complex for the whole island by SEACC, SEATrails, and other local groups. The highway itself is an attraction for motorists as well as visitors on bicycles and motorcycles and has been identified as a Scenic Byway promoted to tourists worldwide. Existing Forest Service infrastructure includes the Control Lake Cabin and boat launch, the Eagles Nest Campground and canoe launch, the Balls Lake Picnic area, the Balls Lake Trail, the Honker Divide Canoe Route, and the Cutthroat Road. See DEIS, Table REC-2 at 3-448. Projects underway include an expansion and hardening of the Balls Lake Trail, with a possible connection to the Cutthroat road, and upgrades to the cabins and portages of the Honker Canoe route. These are significant investments by the Forest Service in the POW recreation complex, and private business owners include these facilities in their tourism related business planning. More clearcut logging along the Thorne Bay road, especially unit number 27, negates this planning and disregards a key multiple use orientation for the Forest. The example of the Logjam timber sale units cut directly alongside the Coffman Cove Road, another part of the Scenic Byway system, demonstrates the effects of irresponsible timber planning on scenic values and potential income from tourism businesses.”

“More consideration should be to the effects of a timber sale on the non-consumptive user group, especially the large and growing wildlife tourism industry.”

“The DEIS needs to take a harder look at how timber harvesting activities impact the recreation economy. The DEIS notes that timber harvest activities would be readily apparent in the vicinity of key project area recreation places but concludes that action alternative impacts would be short-term, temporary disruptions, that access to fishing and hunting activities would remain consistent, and that action alternatives would not contribute to longterm changes in project area recreation use. [DEIS at 3-458-3-463]. The DEIS fails to address the extent to which the quality of the experience is important to ensuring that visitors return year after year. Further, a significant portion of visitor expenditures becomes direct income to business owners and workers in recreation-related industries (e.g. gas stations, grocery stores, outfitters). Visitors spend income in the local area to replenish inventories or to purchase consumer services. Theses indirect effects generate income throughout the community.”

Forest Service Response:

According to the recreation report for the Big Thorne Project, harvest activities are unlikely to affect recreation activities on the Control Lake Complex sites, because these recreation sites are excluded from harvest unit areas and proposed units would be unseen or visible only in the background aspect, which allows for more variation in the visible quality of the area.

Uneven-aged management proposed in the project poses less of a visual impact than clearcut harvest techniques, because trees are left in the area and the visual change on the landscape is minimized. In units where visual concerns have been identified, the unit design follows Forest Plan Standard and Guidelines.

The recreation resource and socioeconomic resource reports provide information about the non-consumptive user group and tourism. These reports acknowledge the growing tourism industry on Prince of Wales Island although most research points out that tourism on Prince of Wales is most closely related to charter fishing on saltwater. Nevertheless, a growing interest in recreation activities and passive touring/wildlife viewing has been observed. The Forest Service maintains several recreation sites and trails within the project area, where harvest activities are planned and designed to avoid these areas, so that visitors may continue to enjoy these beautiful places, watch wildlife, hunt, fish, and enjoy the outdoors. Tourism and recreation are further supported within the project area with several improvements planned for the next 1-5 years, including improvements to the Balls Lake Trail, an upgrade the Control Lake Cabin dock, new bridges on the Boy Scout OHV Trail and a new young-growth cabin at Sal Creek. All of these improvements are likely to benefit the tourism industry on Prince of Wales Island and work cooperatively with proposed harvest activities.

The Forest Service is also working on stewardship projects associated with the Big Thorne Project that would benefit wildlife, fisheries, and other resources.

The socioeconomic report discusses the indirect effects of recreation and tourism on the local economy. The majority of tourism to Prince of Wales Island is associated with saltwater charter fishing. Much of the land-based recreation depends on the extensive road system to access fishing, hunting, recreation trails, campgrounds, picnic areas, and cabins. Timber harvest and recreation opportunities are intimately connected on Prince of Wales Island, as the timber associated roads offer access to recreation opportunities across the landscape. Yet the Forest Service also seeks to offer a spectrum of recreation opportunities, from the primitive Wilderness experience to the developed campground experience. The Recreation Opportunity Spectrum (ROS) offers guidance for providing a wide range of recreation opportunities and each LUD has an associated ROS quality. These ROS qualities and any potential changes associated with proposed harvest activities are described in the Recreation Resource Report. All potential ROS changes meet the guidelines for the associated LUDs and therefore support the direction of the Forest Plan for Recreation and land use management of National Forest System lands. No long-term changes to recreation use are anticipated in the Big Thorne Project area because the existing recreation uses of hunting, fishing and use of developed and undeveloped sites are not likely to change as recreation sites and access are not anticipated to change.

Furthermore, the scenic integrity of areas viewed from developed recreation areas and priority travel routes have been protected from major interruption and change, based on Scenic quality objectives in the Forest Plan.

Regional Direction: Transition Framework

Several commenters were concerned with this how this project fits with the Transition Framework.

“Should the project move forward, “the commenter” encourages USFS to implement a project that promotes the Tongass Transition. Such a project should include watershed restoration in high-priority watersheds, improvement of existing roads and stream crossings, forest-stand treatments designed to improve large

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woody debris recruitment and wildlife habitat along with young-growth units, and micro-sales and other timber units that are designed to minimize impacts to fish streams, riparian areas and sensitive wildlife habitat.”

“The “commenter” is opposed to the proposed Big Thorne Timber Sale because it is contrary to USFS efforts to develop a Transition Framework and create a more diverse local and regional economy that is less dependent on old-growth logging. Rather than promote a transition, the proposed action would serve to entrench and prolong the existing unsustainable old-growth industry.”

“This DEIS has no clear relationship to the Department of Agriculture's announced intent to quickly transition from old growth logging.”

“This project can be an important step in implementation of the Tongass Transition Framework. In furtherance of this opportunity, we strongly recommend including the Alternative 5 young growth units as part of the final project.”

“In addition to these considerations the “commenter” recommends adding the young growth commercial thinning units (13 MMBF) identified in Alternative 5 to the Final Preferred Action. Including these commercial thinning units will demonstrate the intent of the Tongass National Forest to begin transitioning to young growth timber and also provide more diverse economic opportunities from this project.”

“We appreciate the effort to transform the Tongass timber program from one dominated by mining old-growth forests to one focused on young growth management and realize that this transformation is complex and will require significant investment over time.”

“The decision to proceed with a project at this temporal and spatial scale runs directly counter to the empty promise of a transition and instead reverts to the practice of designing long term, large volume timber sales dependent on highgrading. There is no justifiable reason to include “transition” goals in the purpose and need statement.”

Forest Service Response:

The transition from a dependence on old-growth timber to a program that is primarily supported by young growth improves the chances of timber industry’s long-term survival in Southeast Alaska. Retaining the existing industry is critical to this approach; therefore, the transition to young growth will be managed at a pace that allows operators to adjust, adapt, and develop markets for new products. The duration and scale at which old-growth harvest will be needed is unclear. Factors such as the role of State and private land in contributing wood supply to a viable industry; the availability of suitable young growth that is mature and economic to harvest; export and domestic processing policies; and fluctuations in domestic and world markets for forest products must be considered but are unpredictable, and will influence the timeframe for transition. The long-term goal for the timber program is for the majority of active forest management on the Tongass to be comprised of ecological restoration, pre-commercial thinning, small and microsale old growth timber sales focused on niche markets, and young-growth forest management.

These projects would in turn supply local and regional wood products markets (Leader Intent: Forest Stewardship and Young Growth Management on the Tongass National Forest” R10-MB-777 letter, January 2013). This letter is located at <http://www.fs.usda.gov/tongass/> under Young Growth Management on the Tongass and is in the project record.

A gradual, rather than abrupt, shift is vital to keep jobs in Southeast Alaska and sustain local communities. A thriving young-growth timber program in the future is only possible with a vibrant timber industry today. Elsewhere in the country, communities have seen the timber industry and its associated economic support fade as milling infrastructure disappeared. Retaining the existing logging and milling infrastructure in Southeast Alaska, and therefore the old-growth timber program, is essential until enough young-growth forest is available for harvest. In the meantime, we need to offer young-growth contracts as they become available to begin the transition and/or incorporate a young-growth treatment component in proposals where it is silviculturally and economically feasible to do so. In addition, management of young-growth forests has been occurring through precommercial thinning since the 1980s. While this does not produce commercial products, it accelerates the development of young-growth stands, possibly reducing the time period needed for those stands to provide commercial value.

Analysis on several scenarios of transitioning to young growth was reviewed (Alexander, et al., 2010) concluding that “Ending old growth timber harvest after 5 or 10 years, even with considerable public investments in young growth management, will not maintain a timber industry in Southeast Alaska.” Several things may need to happen before this transition can occur: the trees in young-growth stands need to be large enough to provide a merchantable product, sawmills in Southeast Alaska will need to be re-fitted to effectively process young-growth logs or new industry needs to be developed and markets need to be available for these industries to make a profit. Currently the young-growth stands with merchantable products can make a profit if exported.

The 2008 Forest Plan Amendment included young-growth harvest in the Spectrum modeling done for timber management analysis for the proposed Forest Plan alternatives. Spectrum is a vegetation management model designed to fulfill the requirements outlined in the 1982 National Forest System Land and Resource Management Planning Act (36 CFR), most importantly Section 219.12(f)(8): “Each alternative shall represent to the extent practicable the most cost efficient combination of management prescriptions examined that can meet the objectives established in each alternative.” Spectrum is the primary modeling tool used to ensure that land allocations and output schedules for alternatives are realistic and meet standards and guidelines in a cost-efficient manner. The interdisciplinary team recognized the option of commercially thinning young growth stands to achieve volume and/or wildlife goals. Young-growth timber was included in the timber outputs of the Forest Plan Amendment and used in the decision for the 2008 Forest Plan. Information on Spectrum is located in the Forest Plan Amendment planning record.

The transition to young-growth harvest has been foreseen since the analysis for the 1997 Forest Plan. Analysis at that time showed the same trend that current analysis has continued to show (Tongass Forest Plan Revision, FEIS, Part 1). See graph for Alternative 11 (the Selected Alternative of the 1997 ROD) on page 3-303. As previously stated, the transition to young-growth management will be gradual and old-growth harvest

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is needed to maintain the industry. See the topic Timber: Progress of the Transition Framework Strategy for details on young-growth projects.

Regional Policy: Export of Timber

Several commenters did not agree with the Alaska Region Export Policy and wanted more explanation.

“A small sale alternative could help to negate the effects of the Limited Interstate Shipment Policy. There would be fewer jobs exported and more jobs would be created through restoration work and young growth thinning. This would be a big step forward to implementing the Forest Service’s transition vision from an old growth industry to young growth industry.”

“It is our view that the BTP cannot proceed concurrently with an export policy that arbitrarily conflicts with the purpose of the Organic Administration Act and the Forest Service’s local processing regulations for Alaska.”

Forest Service Response:

The Alaska Region limited shipment policy is allowed under Federal law and regulation, and the policy and its effects are reviewed annually. On February 20, 2013, the Regional Forester reviewed the annual policy and extended it for 2013. In compliance with 36 CFR 223.201, the Regional Forester has approved timber exports to other states and to foreign markets, namely, limited domestic market opportunities to provide more complete utilization of the timber resource. The Regional Forester reviews the policy annually. The Organic Administration Act is the original law that governed the establishment and administration of national forests. One of the criteria was to furnish a continuous supply of timber. Many other laws have been passed since then and need to be taken into consideration.

Forest Service regulations at 36 CFR 223.201 state (emphases added):

“Unprocessed timber from National Forest System lands in Alaska may not be exported from the United States or shipped to other States *without prior approval of the Regional Forester*. This requirement is necessary to ensure the development and continued existence of adequate wood processing capacity in Alaska for the sustained utilization of timber from the National Forests which are geographically isolated from other processing facilities. In determining whether consent will be given for the export of timber, consideration will be given to, *among other things*, whether such export will:

- Permit more complete utilization on areas being logged primarily for local manufacture,
- Prevent loss or serious deterioration of logs unsalable locally because of an unforeseen loss of market,
- Permit the salvage of timber damaged by wind, insects, fire or other catastrophe,
- Bring into use a minor species of little importance to local industrial

development, or

- Provide material required to meet urgent and unusual needs of the Nation.”

Other things taken into consideration in the Alaska Region when reviewing applications for export are current market conditions and local industry interests and opportunities to market or process material domestically.

Sales are appraised based, in part, on the limited shipment policy. Local purchasers can choose whether or not to ship whole logs to other markets. Sawmills in Southeast Alaska are like any other business, in that they will balance the need to retain a workforce with cash flow needs and continue to employ workers as long as they can stay in business. An increase in shipment of whole logs to other markets may decrease local employment in lumber manufacturing in the short run, but it will help to retain employment in sawmilling both in the short and in the long run by helping keep local businesses viable. Shipping also retains or possibly creates employment in other sectors, such as stevedoring. Export may affect industry related employment, but not necessarily in a negative way since jobs may be created in other sectors, relating to stevedoring and other transportation related employment. Allowing local purchasers to ship some material from timber sales to other markets provides more options for the few remaining locally owned sawmills in Southeast Alaska to remain in business.

While there is nothing precluding small sales under any of the action alternatives, focusing an alternative solely on providing timber for small sales would not be consistent with the project's purpose and need to contribute to a long-term supply of economic timber volume to both large and small operators, provide 2-3 years supply of volume to local mills, and establish shelf volume. Additionally, since the restoration work is intended to be funded through retained receipts from integrated resource timber contracts or retained receipts, less money would be available for this work (and therefore jobs) if only small amounts of timber were offered, since the value of the timber would be less.

See responses to Economics: Jobs and exported timber, Timber Economics: Financial efficiency analysis, NEPA: Range of Alternatives and NEPA: Purpose and Need.

Scenery: Clearcuts and Scenery

Some commenters wrote that they believed the best use of the land proposed for harvest in this project is to leave them in a natural state. They believe clearcuts are an eyesore to cruise ship passengers.

“These lands have far more value if maintained in a wild state than they do as cut timberland criss-crossed with roads. We often work on ships. Clearcuts are a tremendous eyesore to tourists who bring vast amounts of money...”

“This is a sad 'Project' for so many reasons. Prince of Wales has been hard hit by logging in recent decades: one has only to fly over the island to see the devastation! And apparently more is in the planning stages.”

Forest Service Response:

National Forests were created to be multiple-use areas with timber harvest, as one activity of many allowed in specified areas of the forest. The Tongass Forest Plan provides for the

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multiple use of resources and has divided the forest into land use designations (LUDs) that provide for a unique combination of activities, practices and uses. The Big Thorne project area includes seven LUDs. Four of the LUDs allow for timber harvest. These LUDs cover 60 percent of the project area, with the remaining 40 percent off limits to timber harvest. Additionally, Scenery Standards and Guidelines limit the size of openings that can be seen from the visual priority routes and use areas listed in Appendix F of the Forest Plan. The cruise ship route north through Clarence Strait is one such route. Emphasis in unit design included size, location, screening, silvicultural prescription, and harvest system to maintain the overall scenic quality of the area. Please see the Scenery Resource Report, the Scenery section of the FEIS and the Forest Plan Chapter 3 and Chapter 4 pages 4-56 to 4-63 for additional information.

The 2008 Forest Plan identifies visual priority routes and use areas, which include important marine travel routes. High scenic integrity is prioritized from these travel routes. In addition, it is important to note that on Prince of Wales Island, much of the land-based recreation is dependent on the extensive road system, which provides access to fishing, hunting, gathering locations, and recreation sites such as picnic areas, campgrounds, cabins, and trails (Recreation Resource Report and Subsistence Resource Report).

Scenery: Visual Buffers and Blowdown

The commenter is concerned that the visual buffer strips planned for along the highway are likely to blow down and as a result pose a hazard to power lines and vehicle traffic adjacent to logging units. A commenter also has stated that the Forest Service should remove dead and dying timber that poses a risk to roads and power lines.

“We have great concern about any existing trees that have been left adjacent to the power lines and any future plans to leave buffer strips adjacent to the highway and power lines. ...it has been my experience that leaving buffer strips along the highway and power lines have caused numerous problems with damage to the lines and interruption of traffic as a result of blow downs.”

“There is also an issue with existing dead and dying timber along the highway and power lines that needs to be removed.”

Forest Service Response:

The Forest Service shares this concern and plans to address it by utilizing existing young-growth timber, where appropriate, along the edge of the road right-of-way to achieve the visual screening. State Highway 929 was realigned over 15 years ago. Since then, a thick regrowth of young trees has occurred between the road right-of-way and the old-growth timber planned for harvest. We will utilize this regrowth, along with topographical features, to achieve the required visual screening. This regrowth is tall and dense enough to achieve the required visual screening but still small enough to pose a much lower risk to roads and power lines than the old-growth timber the commenter is concerned about.

The removal of hazard trees along highways was not considered as an alternative for this project primarily because the activity does not meet the stated purpose and need nor would it require the extensive effects analysis associated with a large timber sale project

such as Big Thorne. These trees are evaluated on a tree-by-tree basis and different types of projects are utilized in their removal (i.e. salvage, microsale, right-of-way clearing, firewood, free use, etc.).

Scenery: Visual Priority Routes and Use Areas

A commenter suggested removing Forest Plan visual priority routes and use areas in order to adjust the unit size and harvest prescriptions to provide more timber volume.

“4. Implement the following Forest Plan amendments (per Chapter 5) at the Big Thorne Project level:

a. Remove all Visual Priority Routes and Use Areas and the applicable Scenic Integrity Objectives of the Scenery Forest-wide Standards and Guidelines. Adjust unit size and harvest prescriptions accordingly.

“Pursuant to Chapter 5 of the Forest Plan, the “commenter” recommends that the USFS consider amendments to the Visual Priority Routes and Use Areas (VPRs) within the Big Thorne Project area and the applicable Scenic Integrity Objectives of the Scenery Forest-wide Standards and Guidelines.”

Forest Service Response:

The majority of units visible from visual priority routes (VPRs) in the Big Thorne Project area are located within Timber Production and Modified landscape LUDs with mostly low and very low Scenic Integrity Objectives. The removal of these VPRs would result in a relatively minor increase in volume.

Additionally, VPRs were based on the Alaska ferry and cruise ship routes, developed recreation sites and dispersed recreation sites associated with the Thorne River/Hatchery Creek/ Barnes Lake, which was recommended as a Scenic and Recreation River in the Forest Plan. In addition, since then some of the road routes have been identified as the Prince of Wales Scenic Highway after these routes were paved and realigned by the Federal Highway Administration. Therefore, the designation of these routes and use areas for protection as VPRs is appropriate and consistent with the Forest Plan.

Silviculture: Benefits of Pre-commercial Thinning

A commenter has requested the FEIS should discuss and cite the research done in Cole et al (2010) in regards to the limitations or benefits to wildlife habitat from pre-commercial thinning.

“Regarding potential benefits to wildlife from young-growth management, the FEIS should cite Cole et al. (2010), which discusses advantages and limitations of pre-commercial thinning (PCT) relative to wildlife habitat.”

Forest Service Response:

Precommercial thinning is usually practiced in stands less than about 30 years old. The commercial thinning planned under the Big Thorne Project is for stands 50 years old and older. The benefits to wildlife would greatly vary between the two treatments because of the differences in stand conditions and the way the stands respond to the treatment. These

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differences include attributes like the average height of the live crown at time of treatment, the amount of slash remaining after treatment, the potential for and time it might take for tree crowns to refill the openings created, and the condition of the understory prior to treatment.

Precommercial thinning may extend the high habitat values of young clearcuts into an advancing age of young-growth forest, but the stands will likely need treatment again, later, if high habitat values are to be maintained.

The effects of precommercial thinning of 16 to 18 year-old western hemlock-Sitka spruce stands was studied in seven replicated sites on Prince of Wales and Long Islands, Southeast Alaska, by Cole et al. (2010). Treatments were the following: untreated controls, and thinning to 750, 500, 370, and 250 trees per hectare. Cole et al. quantified understory vegetation immediately before treatment and 2, 4, and 7 years post-treatment, thereby providing an understanding of the dynamics of change in response to thinning. The results in Cole et al. (2010) clearly indicated a peak in understory biomass occurring at about 4 years post-treatment, with forbs peaking at about 3 years, and shrubs slowly declining by 7 years post-treatment.

Research is currently underway on the Tongass to study the effects of commercial thinning on understory response. Please see Timber: Transition Strategy.

Silviculture: Partial Harvest prescriptions

The commenter requested the FS develop alternatives with partial cutting prescriptions that fully address wildlife and watershed concerns.

“Our scoping comments thus requested that the DEIS should include alternatives that rely on light-touch partial cutting prescriptions that fully address wildlife and watershed concerns.”

Forest Service Response:

The procedure the silviculturist uses to develop prescriptions is described in R-10 TNF 2409.26d-2013-1, the Silvicultural Examination and Prescription Handbook. The silviculturist is required to consider a reasonable range of regeneration methods that may include even-aged, two-aged and uneven-aged harvests that move the stand from the existing condition to the desired condition. The IDT evaluates the harvest options for each unit under each alternative and, along with the silviculturist, determines the most appropriate system that best addresses Forest Plan goals, LUD objectives and alternative design criteria, while ultimately responding to the purpose and need of the project.

This EIS includes five alternatives for the decision maker to choose from. Each, aside from the no action alternative, has varying amounts of harvest. Alternatives 4 and 5 address objectives for watershed and wildlife habitat. All alternatives utilize varying amounts of uneven-aged management. See Chapter 2, Table 2-1 page 2-15.

Silviculture: Clearcuts Over 100 Acres

Commenter stated opposition to large clearcuts he had noted on previous visits to Prince of Wales Island and believes that the planned units in combination with past harvests

violate the NFMA requirements for maximum opening size. The commenter also believes that the implementation of one unit in excess of 100 acres does not meet the requirement of creating a more desirable contribution of benefits.

“I know what these huge clear cuts look like from the air and the ground. I know what damage the road building and rock pits can do to river systems, of which our salmon industry is dependent upon. I am puzzled why the forest service continues to support this destruction on public land, which few people know about.”

“Also one of the particular risks that merits detailed discussion is the practice of placing many new legally sized clearcuts adjacent to previous clearcuts that are in or soon will be approaching the stem exclusion stage. This is particularly troubling because it creates “creeping megacuts” where new units abut previous clearcuts and create what is essentially one continuous clearcut that exceeds the 100 acre limit. The discussion should assess windthrow risks, buffer blowdowns and whether the prescriptions create the risk of exceeding Forest Plan size limits. If cutting unit density is so high in this VCU that new units must abut the old ones, there is no reason to clearcut additional units in the VCU.”

“The TNF proposes to implement one unit in excess of 103 acres solely because of timber economic considerations. The DEIS provides no indication that the TNF considered impacts to wildlife and fish habitat. Further NEPA analysis needs to provide site-specific analysis of any wildlife or watershed values implicated in the decision to exceed the limit.”

Forest Service Response:

The size of even-aged openings is restricted on National Forest System lands by the National Forest Management Act (NFMA). Forest management activity has occurred on both Federal and private lands, which have no such opening size restriction.

The Forest Plan, page 4-72, provides criteria for determining the size of even-aged openings and is consistent with the Big Thorne DEIS Chapter 3 page 3-422 and 3-424. Although NFMA regulations state that 100 acres is the maximum size of created openings allowed for the Tongass, there are exceptions that are allowed in order to meet management goals. The established limits and exceptions also do not apply to the size of areas harvested as a result of natural catastrophic conditions, such as insect and disease infestation or windthrow.

The desired conditions described by LUD in the Forest Plan explain the expectations for management. In both the Timber Production and Modified Landscape LUDs, the dominant LUDs proposed for harvest, a variety of successional stages resulting from harvest are expected. In the Timber Production LUD it is expected that these stages will be predominantly the early and middle stages. The Forest Plan does not specify how successional stages are to be distributed across the landscape within LUDs.

Stands in or approaching the stem exclusion stage would not be considered openings under NFMA requirements. The stem exclusion stage is explained in the DEIS as the stage in which inter-tree competition becomes intense. Stands in this stage usually are densely stocked with trees well over 30 feet tall.

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The DEIS acknowledges that some past harvest areas adjacent to planned units do not meet the criteria to no longer be considered an opening. In these cases, the combined acreage of the existing and proposed harvests was considered when determining if an opening exceeding 100 acres. Past harvest with regeneration approximately 5 feet or taller were not considered openings based on the criteria in the Forest Plan, page 4-72. The Forest Plan, page 4-72, also states that to be considered separate openings, harvest areas must be divided by another logical timber stand approximately 10 acres in size. All alternatives in the Big Thorne Project were designed to be in compliance with this requirement. The DEIS page 4-424 recognizes that some blowdown may occur along unit edges and efforts to minimize it have been incorporated into the prescriptions. The DEIS page 2-10 identifies windthrow and reasonable assurance of windfirmness (RAW) buffers as design criteria and mitigation common to all action alternatives.

The effects to each individual resource were discussed by alternative in the DEIS. All specialists were aware of the location and ages of past harvest areas in relation to planned units during the alternative design process as well as when they made their effects assessments.

The DEIS page 3-412 acknowledges that Unit 71 is planned for 103 acres and that the unit is long, relatively narrow and has a road needed to access another unit running its length. This road would be stored when all planned harvest activity is completed. Since the DEIS, modifications to the unit due to refined stream mapping have reduced the planned unit size below 100 acres. Unit card contains the site-specific information regarding any concerns about watershed or wildlife values or effects. See also Silviculture: Clearcutting, Large Openings.

Silviculture: Clearcutting and Reforestation

The commenter felt that clearcutting was inappropriate and the Forest Service's efforts at regenerating these stands are inadequate.

"We have lived in many places in Alaska and currently reside in Sitka, and no place was as devastated looking as Prince of Wales. Why is it that animal habitat is not a priority? I don't understand why clear cutting is the answer. Forest Service should be a service to the state of Alaska and its people, not to big business. Your agency continues to rape and pillage old growth forests and your pathetic attempt at reforesting can never replace what God designed."

Forest Service Response:

All clearcuts and other regeneration harvests are required by the National Forest Management Act (NFMA) to be reforested within 5 years. On Prince of Wales Island, this is almost always achieved by natural regeneration. All of the areas proposed for timber harvest are expected to meet the requirements of the National Forest Management Act regulations. Past stocking surveys, which are performed on all harvested lands 3 to 4 years after harvest on the Tongass, have shown that all harvested stands generally have >500 trees per acre, with many exceeding 2,000 trees per acre within 3 years of harvest. Please see also Silviculture: Justification for Clearcutting response to comment.

Silviculture: Disclose Regeneration Surveys by Elevation

The commenter requests the results of regeneration surveys be categorized by elevation.

“...please disclose the results of regeneration stand surveys categorized by elevation. For example, is there adequate regeneration above 1000 feet in elevation?”

Forest Service Response:

Stratification of regeneration by elevation is not possible because regeneration data is available only at the stand level, and most stands have a wide range of elevation often exceeding 500 feet.

Silviculture: Justification for Clearcutting

The commenter believes the DEIS failed to closely examine the effects of clearcutting on other forest resources and that the justifications for clearcutting are not supported by the analysis.

“For example, neither dwarf mistletoe nor windthrow risks justify the decision to clearcut stands with significant cedar composition. The DEIS also needs to provide further analysis and a site specific discussion of windthrow risks when those risks are used to justify clearcutting. The DEIS failed to disclose that clearcutting increases risks to remaining old-growth forests and patches from blowdown”.

“Our scoping comments requested the DEIS address the legal restrictions on clearcutting. Economic considerations alone do not justify clearcut prescriptions. Clearcuts are only acceptable “in exceptional circumstances” and when these exceptional circumstances exist, the Forest Service must closely examine effects on other resources. The TLMP, for example, requires that clearcuts occur “in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, esthetic resources, and the regeneration of the timber resource.”

“Because of the serious environmental impacts that result from clearcuts, our scoping comments requested that the DEIS should do more than provide a justification for clearcutting in the unit cards based on dwarf mistletoe or other naturally occurring factors. The justification relies on encyclopedic ratings of unit-specific risks that do not demonstrate “exceptional circumstances” that would justify the choice to proceed with clearcuts instead of low-intensity partial cuts prescriptions”.

Forest Service Response:

The National Forest Management ACT (NFMA), Forest Service Manual 2470-R-10-2400-2005-1, Forest Service Handbook 1909.12-2008-1, Forest Service Handbook 2409.26d-2009-1 and the 2008 Tongass Land and Resource Management Plan all give direction on the use of the even-aged clearcutting regeneration method.

All harvests regardless of regeneration method must follow applicable standards and guides. Timber harvest is only prescribed where standards and guidelines for the

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protection of resources as stated in the 2008 Forest Plan Chapter 4 pages 4-1 thru 4-87 can be met.

The even-aged, two-aged and uneven-aged regeneration methods were considered for each stand proposed for harvest in the project. The Forest Plan describes a mosaic of land and resource conditions envisioned for the future. These are to be obtained by following Forest-wide multiple-use goals and objectives and through the cumulative achievement of the goals, objectives and desired condition for each of the individual land use designations. The even-aged method has been proven in the project area to be the optimum system to consistently produce timber stands that meet the goals and objectives of land use designations where the production of an industrial timber supply from healthy forests is envisioned.

All old growth stands proposed for rotational harvest in the Big Thorne Project have reached a point where average growth is being offset or exceeded by decay. This condition conflicts with the basic goals and objectives of the land use designations where they occur.

Other systems that maintain various levels of defective and diseased residual trees compromise the objective of producing an industrial timber supply from healthy forests. Pages 3-416 to 3-424 of the DEIS explain to the decision maker the effects that multi-aged management will have on the timber resource in contrast to even-aged management. This discussion further supports the conclusion that the even-aged method is the optimum method and meets the criteria required for its use.

The Silviculture effects section (DEIS Chapter 3 pages 3-409-3-424) along with the Timber and Vegetation Resource Report and individual unit Silvicultural Prescriptions (available in the project record) provides information to the IDT on the changes to forest vegetation resulting from even-aged management and how even-aged forests will grow and change over time. Each resource specialist has considered these changes in developing the effects section for their particular resource. The DEIS Chapter 3, pages 3-405 to 3-406 and the Timber and Silviculture Resource Report pages 18-24 explain the condition of young growth in the project area and the treatments that have occurred in these stands to date. An explanation of the commitment of old-growth forest structure is made in the DEIS Chapter 3, pages 3-419 to 3-418.

The silvicultural prescriptions document the detailed diagnosis of stand conditions in each unit. This is the information the silviculturist uses to determine if clearcutting is justified direction outlined in the Forest Service Manuals and Handbooks, The Forest Plan, and the NFMA. The silviculturist assists the IDT in determining the harvest methods for each unit based on the design criteria established by alternative. Clearcutting must be justified before it becomes a potential harvest method the IDT would consider. The choice to clearcut a unit is made based on the consensus of the IDT, not purely on the justification.

The silvicultural prescriptions and supporting field data can be found in the project record.

The selection of the proper regeneration method for each proposed harvest area is based on a number of considerations in addition to the occurrence of mistletoe within the existing stands and the propensity for it to be of issue within the next rotation. The DEIS Chapter 3 pages 3-406 to 3-407 addresses how mistletoe impacts forest health and timber

production. The DEIS Chapter 3 page 3-419 to 3-420 explains the effects of the proposed alternatives on the occurrence of mistletoe under each management scenario. The DEIS page 3-412 and the Timber and Silviculture Resource Report explains the justification for clearcutting.

The wind risk rating for each unit is determined from topographic and field data. These ratings are documented in unit specific Windthrow Evaluation Checklists available in the project record. The form was developed from information in Stathers, R.J., T.P. Rollerson, and S.J. Mitchell (1994), *Windthrow Handbook for British Columbia Forests*, and documents topographic exposures, boundary orientation, stand and tree attributes, and past windthrow evidence.

The overall influence of wind on stand structure seen in the project area typically predates any past harvest activities. There are no known areas in the project where stand structure is being modified at a stand-level scale because of wind damage occurring directly as a result of openings created by past even-aged management activities. Pages 13-15 and 48-49 of the Silviculture Resource Report and pages 3-407 to 3-408 of the DEIS discuss wind disturbance in the project area. Pages 3-421-3-423 of the DEIS discussed the direct and indirect effects on wind risk the proposed harvest methods may have. The following will be added to the discussion in the FEIS and Timber and Vegetation Resource Report: Stathers, R.J., T.P. Rollerson, and S.J. Mitchell 1994. The *Windthrow Handbook for British Columbia Forests* states that “Clearcuts can increase windthrow hazard by increasing wind speed and turbulence. Windthrow usually occurs on the downwind edge of clearcuts and can extend into the stand for hundreds of meters, although most damage is usually concentrated within the first 10-20 meters of the boundary. Less damage occurs on the upwind boundaries and along boundaries the parallel storm wind directions. Opening size does not appear to play a significant effect on the amount of windthrow.” “Openings less than about 2.5 acres are typically windfirm. Wind tunnel experiments with model forests have shown that the force on the downwind edge of a clearcut is dissipated within a short distance into the stand but the turbulence can be high for a few tree heights downwind until windflow is reattached to the canopy.”

The silvicultural prescriptions found in the project record specify that the boundaries of even-aged openings are to be located where a windfirm edge will be maintained if possible. Where this edge cannot be located and resources are determined to be at risk, special measures to assure reasonable resistances to windthrow will be applied. The Cumulative Effects section in the DEIS Chapter 3 on page 3-423 to 3-424 advises the decision maker that windthrow adjacent to harvest openings has occurred in the past and that harvest activities create a risk of future windthrow along abrupt stand edges. See also Silviculture: Clearcutting and Alternative Development.

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Silviculture: Legacy Design and Structure

The commenter suggested using the stands proposed for uneven-aged management as replacements for legacy elsewhere and believes the Forest Plan legacy standard and guide is inadequate.

“Perhaps the residual stands in partial cut areas could replace the “Legacy” set-asides. That would make the proposed set-asides available to help with both economics and timber sale volumes.”

“We explained in our TLMP appeal that there is no scientific support for the acreage threshold and prescribed retention levels. The primary reason for adopting legacy was to improve timber economics. Further NEPA analysis should reconsider additional retention of old-growth forest structure in clearcut units.”

Forest Service Response:

Maintaining legacy stand structure is required within any harvest opening, including combinations of adjacent units, greater than 20 acres in certain areas. This is to ensure that sufficient residual trees, snags, and clumps of trees remain in timber harvest units within value comparison units (VCUs) that have had concentrated past timber harvest activity. Locating legacy forest structure elsewhere other than where it would function as a part of that opening would not meet the intent of the standard and guideline. See DEIS Appendix B the Unit Card Introduction pages 2-5, and the Forest Plan page 4-90 for additional information.

The rationale of the Legacy Standard and Guideline is explained in the decision on the 2008 Forest Plan Amendment (ROD p. 23) and discusses how legacy benefits wildlife. The Big Thorne Project implements the Legacy Standard and Guideline as described in the Forest Plan on page 4-90. A discussion of how the IDT determined the appropriate acreage and the strategy for placement is available in the introduction to the unit cards in Appendix B of the DEIS and FEIS. The DEIS page 2-10 discusses legacy as a design criteria and mitigation common to all action alternatives. Alternative 4 utilizes two-aged and uneven-aged management in a number of units to mitigate the effects of timber harvest on wildlife.

Silviculture: Mitigation Measures for Yellow-cedar

The commenter requests information on recent practices suggested to improve yellow-cedar species composition on recent projects and if mitigation measures are suggested for the Big Thorne Project. They are also concerned if deer browse is having an effect on redcedar regeneration like in northern B.C. They request that further NEPA analysis should discuss the significant role of climate change on cedar management.

“Have there been any additional considerations with regard to whether the experimental method of using leave trees has been successful? Is natural regeneration so poor that mitigating measures will be necessary? Is deer browse having the same dramatic effect on red cedar regeneration as it does in northern British Columbia islands? [Stroh, N. et al. 2007]. Further NEPA analysis should

also disclose the significant role of climate change on cedar management. [Hennon, P.E. et al. 2007].”

Forest Service Response:

Pre-commercial thinning treatments on Prince of Wales Island have evolved since the practice began in the late 1970s. Until the early 1990s, the treatment mainly favored the retention of Sitka spruce and western hemlock. Now Alaska yellow-cedar and western redcedar are most often the first priority for retention. We have also adopted a different pre-commercial thinning prescription for some stands. This prescription thins cedar to a more narrow spacing than spruce or hemlock within the same stand. This not only promotes more cedar trees per acre but also should help control large low limbs that seem to persist when redcedar are thinned at wider spacing. These measures promoting both yellow and redcedar will be used where appropriate for future pre-commercial thinning in the Big Thorne project area.

Yellow-cedar planting is scheduled to occur on the Diesel and Slake Timber Sales. About 100 yellow-cedar per acre will be planted on about 700 acres in the spring of 2013. Planting sites will focus on the most advantageous locations where the species is expected to be able to resist decline into the future. The Forest Service is teaming with Oregon State University and Sealaska Corp. on the project to study ways to promote the survival of planted yellow-cedar.

The planting of yellow-cedar will be considered for even-aged management units in the Big Thorne Project. District and research scientists will work together to identify opportunities to assist the movement of the species to sites where the long-term resistance of decline is likely.

Redcedar regeneration is prolific within past harvest areas in the project area with no indication that deer browse is affecting the regeneration of the species. The uneven-aged harvests proposed will rely on residual redcedar, particularly established advanced regeneration, understory and midstory trees more than new regeneration to represent the species in the next rotation. These trees will typically be taller than the deer can browse so we are not expecting any significant loss due to deer. Please also see Silviculture: Yellow-cedar Regeneration.

Silviculture: Reasonable Assurance of Windfirmness (RAW) Buffer Review

The “commenter” is concerned why some streams where not scheduled for RAW buffer review when the unit card text identified certain concerns that would indicate RAW might be necessary.

“The stream-specific information in the Fisheries sections of a large number of the unit cards identifies blowdown, steep side-slopes, and active erosion within the riparian buffers as a concern (e.g., Units 14, 27, 33, 121, 138, 145, 557). However, many of these same cards indicate that Reasonable Assurance of Windfirmness (RAW) zones beyond the standard riparian buffers are not needed to mitigate this concern (e.g. "Buffer (RAW): no review needed"). These apparent discrepancies should be addressed prior to the release of the FEIS and Record of

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Decision to ensure that potential windthrow effects on water quality and fish habitat are effectively mitigated, with the planned mitigation measures (i.e., RAW zones) documented on the unit cards.”

Forest Service Response:

All Class I, II and III streams were reviewed by the IDT to determine if a field RAW buffer review was warranted. Streams determined to not be at risk from additional harvest-associated windthrow were not recommended for review even if they listed stream-specific concerns on the unit card. There were four general circumstances where field review was considered not warranted. The harvest occurred on the downwind side of the stream to the lee of prevailing storm winds. Unit 14 stream 1.29L, Unit 33 stream 1.4R4L and Unit 121 stream 1.1L are examples. The second circumstance is where the prescription for the harvest adjacent to the stream was uneven-aged management, where harvest openings will be limited to 2 acres or less. The marking guides for these units will address RAW concerns with specific direction limiting harvest adjacent to streams. Unit 145 stream 1 (Alternative 4) is an example. The third is where the harvest opening adjacent to the stream is small and the stream runs parallel to prevailing storm winds. Unit 27 stream system 1 is an example. The last is where the stream is already being protected in some way either by the boundary being away from the stream or by legacy being placed to account for RAW. Unit 138 stream system 1 is an example of legacy placement and the harvest being on the lee side of the stream (eastern portion of unit).

No RAW buffers were prescribed for young-growth units since the canopy will remain intact and marking guides will specify any additional retention that might be needed to assure windfirmness.

Silviculture: Thinning for Wildlife or Timber

The commenter is concerned that the planned thinning treatments will not result in an increased deer population in the project area.

“...there has been an attempt in recent years to rewrite the book regarding the value of thinning on those populations. This rewrite has been parallel with so-called stewardship projects where thinning has been touted as the panacea to revive deer numbers. It is however, also a widely accepted fact that the benefits to deer populations from thinning are minimal, temporary, and expensive and for treatments that offer the most benefit (i.e. gap thinning), they are prohibitively expensive. In fact, the DEIS offers little hope, based on thinning projects from 2009 and 2010 that future POW thinning projects would be feasible due to a “lack of consistent second growth timber sales” (at 3-27). Regardless, the “planned treatments” for second growth (at 3-26-29 and B-7,) fail to implement any real measures to benefit deer populations and rather, rely on silvicultural techniques to increase mean annual increment, not deer populations.”

Forest Service Response:

Pages 3-26 to 3-29 of the DEIS discuss the proposed commercial thinning of young growth from a logging system, harvest cost, and contribution to the timber supply perspective - Issue 1: Timber Supply and Timber Sale Economics.

The Timber and Vegetation Section later in the document (pages 3-413 to 3-416) describes the proposed young-growth treatments and environmental consequences from a silvicultural perspective. This section explains how the proposed treatments will help move them from the existing to the desired condition over time.

The management goal for young growth in the project area, as stated on page 3-414, is to produce an industrial wood supply while improving wildlife habitat, improve stand growth and vigor, and aid in the transition to young growth focused equipment and markets.

Improving wildlife habitat over time is also goal; however, the treatments are not always designed to specifically improve deer habitat. An Interagency meeting was held at the USFS Southeast Alaska Discovery Center on 9 April 2013. The purpose of this meeting was to discuss the wolf population sustainability issue in Central Prince of Wales, and specifically the Big Thorne project area. Topics discussed by the group included: 1) road/access management closures, 2) deer habitat enhancement, and 3) pre and post treatment monitoring of the thinning sites.

Thinning would occur in stem exclusion young growth, on slopes greater than 10 percent, with aspects between 90-270 degrees. Prescriptions could include strips at least 80' wide, with the longer dimension oriented up the hill, and forested strips in between at least 2-3 times the width of the cut. It would also be best to locate thinning in the largest blocks of stem exclusion near towns and villages to improve potential hunting opportunities.

The group agreed on several priority sites for commercial thinning treatments that would benefit deer. Several general areas were identified for these treatments: the area of young growth immediately behind Thorne Bay (there are currently several areas proposed for commercial thinning in the Big Thorne EIS in this area); Sal Creek area (again the Big Thorne project proposes some commercial thinning in this area); Ratz and Little Ratz Harbor area (again also proposed area of thinning in the Big Thorne project); areas outside the project area included a large area on the north side of the Coffman Road; areas on the 3035 road; an area along the 2050060 road has demonstration gaps, but would be a good area for additional thinning on the slope above the road; and along east side of the mainline road near Windgate Cave/Halfway House. These suggestions have been passed on for consideration by the responsible official for inclusion in the ROD or for stewardship projects.

Pages 3-416 to 3-423 of the DEIS describe the effects of the treatments on forest structure, forest health and productivity, tree regeneration and species composition and windthrow risk. Also see Timber: Transition Strategy.

Silviculture: Uneven-aged Management Harvest Prescriptions and Volumes

The commenter is concerned that a partial harvest prescription that plans for an economic future entry will negatively affect the economics of the currently planned harvest. A commenter is also concerned that the projected volumes of the helicopter partial cuts are overstated.

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“...the silvicultural prescription in the appendix indicates that the agency’s intent is to have a residual stand that will have sufficient higher value trees to support economic harvesting in the future. That is a good goal, but it also reduces the amount of high value timber that can be harvested with the initial entry.”

“...we are concerned that the projected volumes of helicopter partial cuts are also overstated. We expect that in most areas, an average of less than 5 mmbf per acre can be profitably harvested with a helicopter.”

Forest Service Response:

The partial harvest uneven-aged management prescriptions planned in the Big Thorne project describes three general types of trees that should be retained for the future. These are crop trees, wildlife trees and advanced or new regeneration.

Crop trees are young, healthy, well-crowned trees of good form and vigor that are mostly disease free and of desired species. These trees will normally be in the intermediate or co-dominant crown class. These are the trees we are depending on to grow into the overstory and into the high value trees that make the next rotation economical. They are of lower value now mainly because of size, not form or clear bole.

Wildlife trees are the low value timber trees that may have high defect, poor form or low grade; all characteristics that make these trees more valuable for wildlife than for timber. These trees will normally be in the dominant and co-dominant crown classes.

Advanced and new regeneration trees are the new trees that will grow into any opening created by harvest, as well as the smaller, already established, understory trees that will take advantage of the newly created growing space in openings in the canopy. These trees are currently in the intermediate and overtopped crown classes.

By retaining those three general types of trees to provide for the next entry, the harvest in this entry can focus on the mature high timber value trees that are in the stand now and that are likely to lose value before the next entry.

Regarding harvest volumes, the Inventory methods and units of measure are explained in the Timber and Vegetation Section of the DEIS page 3-401. Timber volumes are estimates and vary in accuracy. Please also see Timber: Falldown.

Silviculture: Windthrow Risk Evaluation

The commenter believes the DEIS failed to consider species composition when determining windthrow risk and that windthrow risk should be assessed based on realized and potential climate change.

“The DEIS further failed to assess the comparative susceptibility of hemlock and spruce and cedar stands to windthrow”.

“...windthrow risk should also be assessed in light of both realized and projected climate change impacts. Credible data regarding significant increases in wind intensity and projections indicating increased windthrow risks need to be considered in the DEIS. The TNF should update the models used to assess windthrow risk to account for the increased risks. If this has not been done as part

of the Forest Service’s monitoring and adaptation responsibilities under the TLMP or pursuant to national guidance for addressing climate change, the DEIS should explain why”.

Forest Service Response:

The windthrow hazard evaluation performed for each unit utilizes both tree and stand characteristics in the determination of risk. Stand factors such as uniformity, height, density and tree species are considered. Stem taper, butt flare and rooting depth are tree factors that are evaluated. Even though each tree species or stand composition may exhibit more or less factors indicating windfirmness, other factors such as topography, stand structure and past history are equally important. See the Timber and Silviculture Resource Report page 13-15 for discussion of windthrow and the role species composition plays.

There are no known pure stands of cedar or spruce in the proposed harvest areas although some stands may approach nearly 100 percent hemlock. Since almost all stands are a mix of species, there is no basis from which to form anything more than an anecdotal evaluation of wind risk based solely on tree species. See also Silviculture: Justification for Clearcutting.

The effects section in Chapter 3 on page 3-424 acknowledges the possibility that a large-scale wind event or events will substantially modify old-growth timber stands in the future, regardless of any proposed management activities (see Alternative 1 direct and indirect effects in Chapter 3 page 3-416 of the DEIS).

Wind risk ratings were conducted between 2009 and 2011. These rating have taken in account realized climate change since they were based on present-day field conditions. Assessing the effects of potential increased future wind risk in harvested units due to climate change must consider the changes that will occur to stand and tree attributes that partly define wind risk, not just that the effects of future increased wind intensity. Pages 3-416 to 3-422 of the DEIS address the expected changes the proposed harvest treatments will have on forest structure, forest health and overall windthrow risk. All harvested areas will grow trees back; these trees will quickly eliminate the abrupt stand edges created by even-aged management and fill in any openings created using other regeneration methods. The DEIS indicates that stands following an even-aged management regime that includes intermediate treatments like pre-commercial or commercial thinning are likely to have a lower wind risk than the old-growth stands they replace on any give topographic exposure. We would expect this lower risk would mostly offset any increases in wind intensity related to climate change. Stands harvested using uneven-aged management will for the most part maintain the same stand and tree attributes they had before harvest. Forest managers will, however, be able to adjust future harvest entry prescriptions to account for any noticed changes in windthrow risk. The next scheduled entry into uneven-aged stands will be in about 30 years.

The status of the Forest Service’s monitoring and adaptation responsibilities under the Forest Plan and pursuant to national guidance on climate change are beyond the scope of the Big Thorne Project.

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Silviculture: Yellow-cedar Conservation Strategy

The commenter states that the DEIS should have discussed the developing strategy for yellow-cedar conservation and its relevance to the project. That DEIS should have developed alternatives that avoided healthy yellow-cedar stands, provide a description of specific cutting units that do involve taking yellow-cedar, disclose how many units occur in areas of adequate soil drainage where cedar decline is less likely to occur, and shift harvest to dead yellow-cedar forests.

“The DEIS also should have discussed the Alaska Region’s developing strategy for cedar conservation and how it is relevant to this project. Because of the forest-wide significance of this issue and because of the extent of cedar decline in the project area, we requested that the DEIS should consider it carefully and develop alternatives that avoid taking healthy yellow cedar stands. We also requested a description of specific cutting units for alternatives that do involve taking yellow cedar. The body of the DEIS should disclose how many cutting units occur in areas of adequate soil drainage where cedar decline is less likely to occur? Further NEPA analysis should disclose and consider the recommendations of Alaska Region scientists that harvests be shifted to dead yellow-cedar forests.”

Forest Service Response:

The Timber and Silviculture Resource Report addresses yellow-cedar decline and the developing conservation strategy. There are currently efforts underway to devise a conservation strategy for yellow-cedar in Southeast Alaska. The first step in this strategy is partitioning the landscape into areas where yellow-cedar is no longer well adapted (i.e., maladapted in declining forests), areas where yellow-cedar decline does not now occur but is projected to develop in a warming climate, and areas where decline will not likely occur. The complex cause of yellow-cedar decline can be reduced to two main landscape considerations: snow cover and drainage. Where snow cover is inadequate, yellow-cedar is limited to better-drained sites (Hennon et al, Bioscience 62 page 154). Unfortunately, on these better sites, other tree species like western hemlock and Sitka spruce can naturally out-compete yellow-cedar for available resources. Yellow-cedar can, however, be promoted on better sites as well as on sites at higher elevation with adequate spring snow, through active forest management activities such as even-aged harvesting followed by planting and pre-commercial tree thinning.

Although these efforts are underway and undergoing further research, the Forest Plan does not include specific management direction pertaining to yellow-cedar regeneration. Rather, the Forest Plan ROD identifies that the best course of action, in light of uncertain but anticipated change, is continued management for resiliency with a robust monitoring program that allows for adaptive management intervention (Forest Plan ROD, p. 50). At the time of pre-commercial thinning even-aged stands, Alaska yellow-cedar and western redcedar will be favored and selected as leave trees, if appropriate for the site. This is an effective and economical way to increase the percentage of cedar being carried into the next rotation.

The silvicultural prescriptions and diagnoses available in the project record describe the percentage of dead yellow-cedar within each planned harvest unit, and if yellow-cedar

decline occurs there. Dead yellow-cedar trees meeting merchantable specifications will be utilized to the same degree as other timber. See also *Silviculture: Yellow-cedar Decline and Impacts to Redcedar*.

Silviculture: Yellow-cedar Decline and Impacts to Redcedar

The commenter is concerned that the Big Thorne Project will contribute to the extinction of red and yellow-cedar and that the analysis of impacts to cedar was inadequate.

“Our scoping comments requested that the DEIS address cedar highgrading, consider yellow cedar decline and climate change, and provide information about regeneration in logged areas. In particular, we requested alternatives that avoid healthy yellow cedar stands. But the DEIS failed to provide enough information to assess the impacts of removing high levels of yellow cedar and how this project fits in with biome-wide red cedar removals now that the Tongass functions as a refuge for this species. The TNF has removed disproportionate amounts of cedar in order to generate positive appraisal sales for decades with no end in sight. The DEIS simply does not demonstrate the TNF’s efforts to maintain and assess cedar viability in light of the cumulative effects of logging and climate change.”

“The DEIS needed to separately discuss the cumulative impacts of logging and cedar decline and disclose that those effects will lead to diminished populations in light of poor post-logging regeneration. The discussion in DEIS further did not candidly disclose the risks associated with removing healthy cedar stands such as how logging can exacerbate cedar decline by creating canopy gaps.”

Forest Service Response:

The IDT considered yellow-cedar and decline as potential alternative driving issues. See page 2-14 and 2-15 of the DEIS. After discussion, it was determined that since yellow-cedar is common in the project area and particularly so on non-development lands and others where no timber harvest will occur and that these lands far exceed the lands proposed for harvest, and that since the harvest proposed on development lands allows for the active management of the species, a yellow-cedar avoidance alternative was not warranted.

The Forest Service has acknowledged the possibility of continued yellow-cedar decline with climate change, as well as the possibility of a shift in the range of the species (Forest Plan, 2008, page 3-120).

In considering yellow-cedar, it is important to note that climate change was addressed in the Forest Plan. The Forest Plan ROD states that best course of action in light of uncertain but anticipated change will be done through maintaining mostly intact ecosystems (Forest Plan ROD, p 50).

Chapter 2 of the Forest Plan describes goals and objectives the plan is designed to meet. Biodiversity and plants are categories where specific goals and objectives are listed. The plant category goal is to maintain viable plant communities and populations: maintain a mixture of habitats that are capable of supporting the full range of naturally occurring flora, including a variety of vegetation types, botanical life forms, patterns, structural

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components, and the consideration of rare species with the objective of preventing species from becoming listed as threatened, endangered or sensitive. We believe the conservation strategy inherent in the Forest Plan addresses concerns for cedar viability in the project area.

Chapter 2 of the DEIS discusses alternative development and presents a comparison of alternatives. The cedar component of a unit was not a determining factor in whether or not to include a unit in any alternative. Additional discussion of the comparison of species composition between areas proposed for harvest and all suitable and available lands in the project area has been added to the Timber and Silviculture Resource Report.

The DEIS pages 3-420 to 3-421 (Direct and Indirect Effects on Regeneration and Species Composition) discusses how the silvicultural prescriptions will affect regeneration efforts. Pages 3-419 to 3-420 (Direct and Indirect Effects on Forest Health and Productivity) discuss how forest health and productivity may change by alternative. Alaska yellow-cedar regeneration is found in newly regenerated units and in stands that were recently pre-commercially thinned within the project area. (The project record contains a sample of regeneration survey and precommercial thinning plots conducted previously in the project area). Any stands that are harvested by this project will be surveyed after the third growing season to ensure that species mixes similar to pre-harvest are maintained where appropriate.

The Timber and Silviculture Resource Report discusses yellow-cedar decline in detail.

Regarding canopy gaps and the potential to intensify yellow-cedar decline, the current research indicates that there is cascade of factors responsible for yellow-cedar decline. Soil drainage is the most important factor to consider. The association of yellow-cedar decline with wet soils has been well documented. Yellow-cedar trees growing on poorly drained soils have shallow root systems that are predisposed to freezing. Poor soil drainage, particularly where the soil has become wetter since yellow-cedar became established on the site, forces the majority of fine roots of these trees to be shallow. (Hennon P.E., D.V. D'Amore, D.T. Wittwer, J.P. Caouette 2007 Proceeding of the National Silviculture Workshop Yellow-cedar Decline: Conserving a Climate-Sensitive Tree Species as Alaska Warms). Open canopy conditions increase exposure but do not alone result in yellow-cedar decline. The decline does not appear to occur on better-drained sites nor does it seem to appear in younger healthy trees, even on wet soils. It could be that young trees that establish on wet sites tend to avoid root freezing due to the availability of microsites suitable for deeper rooting (personal communication with P. Hennon on 2/13/09).

Within a few years following harvest activities, we expect ample tree regeneration to occupy the openings created by both even-aged and uneven-aged harvests. This cover will provide an insulating effect not found within the open-canopied old-growth cedar stands where decline-related mortality opens the canopy and predisposes adjacent trees to decline. For this reason, we do not believe that the openings created by uneven-aged or even-aged harvest would predispose residual yellow-cedar to decline in a manner that would defeat the objectives of the silvicultural prescription.

The individual unit prescriptions and diagnoses available in the project record document forest health concerns for every unit, including occurrences of yellow-cedar decline, soil

type and condition, elevation and other factors that may predispose units to decline. Each prescription and diagnosis rates the average tree condition by species. They indicate that old-growth red and yellow-cedar overstory trees are typically mature to over-mature with volume growth rated as either static or declining. This holds true in even in stands where yellow-cedar decline is not present. These conditions indicate stress and poor overall stand health and emphasize the need for active management of yellow-cedar on the suitable land base as a mean to promote the species.

Silviculture: Yellow-cedar Regeneration

The commenter disagrees that adequate regeneration of approximately the same species composition can be reestablished in areas planned for harvest. They believe this will jeopardize yellow-cedar and as a result be in non-compliance with the TLMP direction regarding the requirement to monitor forest health and evaluate silvicultural prescriptions in light of future stand diversity, particularly overstory species such as yellow-cedar. They are concerned that the DEIS did not disclose the likely changes in post-harvest species composition, identify barriers to regeneration and discuss recent research. They are concerned the DEIS did not display the actual regeneration rate of yellow-cedar versus other species in past harvest areas in the project and they request the results of regeneration surveys be categorized by elevation.

“...the assurances of adequate regeneration in the DEIS are inconsistent with the Alaska Region’s findings on cedar regeneration. The 2008 TLMP amendment requires the Forest Service to monitor forest health and evaluate silvicultural prescriptions in light of future stand diversity, particularly overstory species such as yellow cedar. Past regeneration surveys suggest that this project will convert substantial acreage from cedar forests to low-value hemlock forests. But the DEIS states that precommercial thinning will favor cedar retention and “is expected” to increase yellow cedar stand composition in the future. It also asserts that natural regeneration will result in re-establishing the original species stand composition. These statements failed to disclose likely changes in post-harvest species composition, identify barriers to regeneration and discuss recent research. It asserted that composition would remain the same but did not disclose the actual regeneration rate of yellow cedar versus other species in the project area.”

Forest Service Response:

Additional information addressing this request has been added to the FEIS under “Direct and indirect Effects on Regeneration and Species Composition within the Timber and Vegetation section of Chapter 3 and in the Timber and Silviculture Resource report.

The Forest Plan (p 4-70, Stage II Intensive Inventory - Item F) states that a silvicultural prescription includes an appropriate mix for regeneration. The “appropriate species” is based on the potential of the site as indicated by plant associations and the stand conditions. In areas where yellow-cedar is no longer well adapted, it may not be appropriate to prescribe yellow-cedar for regeneration. In other areas, such as north-facing slopes or well-drained soils, it may be quite appropriate to encourage and maintain a yellow-cedar component in the prescription, based upon site-specific conditions. It is not reasonable to expect to regenerate all species on all sites.

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Alaska yellow-cedar is not considered a rare species on the Tongass. There is a punctuation error in the Forest Plan p. 4-70, which caused yellow-cedar and western redcedar to be grouped with Pacific yew, Pacific silver fir, and subalpine fir as rare species. The cedar species are not considered rare species and there should be a period instead of a comma after naming them (email from Krosse, Forest Ecologist, July 3, 2008). The corrected version is as follows:

I. Stage II Intensive Inventory ...

H. Consider regenerating and maintaining a mix of dominant overstory tree species, where appropriate, for the site, to provide for the diversity of future stands and to augment the future availability of forested habitats used by other species (wildlife and plants). Common, but less represented Forest-wide overstory species include yellow-cedar and western redcedar. Pacific yew, Pacific silver fir, and subalpine fir are considered rare tree species (see Plants Standards and Guidelines, Section C).

Silviculture: Young Growth Management

The State is concerned with a transition approach that develops young-growth stands in the project area with less volume per acre and extends the time needed to meet CMAI. The State recommends that the Tongass National Forest develop a forest-level plan for rotational management of even-aged timber stands prior to implementing any commercial young-growth treatments at the project-level within the development matrix.

Other commenters are concerned with the scheduling and marketability of young growth from the Tongass.

“For units where young-growth treatments are proposed under Alternatives 3, 4, and 5 (DEIS, 3-418), “The culmination of mean annual increment (CMAI) and the 95 percent CMAI would be achieved, on average, approximately 5 to 10 years later than in an untreated stand.” The DEIS (page 3-420) further explains that, “Stand volumes at harvest age would likely decrease, but tree diameters would be larger and trees would be more resistant to windthrow.” The “commenter” is concerned with a transition approach that develops young-growth stands in the project area with less volume per acre and will extend the time necessary to reach CMAI. The “commenter” recommends that the Tongass National Forest develop a forest-level plan for rotational management of even-aged timber stands prior to implementing any commercial young-growth treatments at the project-level within the development matrix.”

“The DEIS should also candidly address some of the impediments to the development of this industry. How many second-growth stands in the project area and on POW will be of commercial size over the next few decades? Also, please discuss the comparative advantages vis a vis competitors in the wood products industry.”

Forest Service Response:

In May 2010, the Southeast Alaska Transition Framework was proposed by the Department of Agriculture Secretary to guide and enhance economic development and

timber harvesting opportunities outside of roadless areas. The framework is to provide jobs and community stability for Southeast Alaskan communities in an effort to diversify the economy while proposing a new approach to forest management on the Tongass National Forest that is to build from the existing Tongass Land Management Plan (2008) and move timber harvesting into roaded, young-growth areas and away from old-growth timber in roadless areas. In response to this, three of the four action alternatives developed in the Big Thorne Project included harvest of young-growth timber through commercial thinning. The alternatives provide a range of young-growth volume of 13.5 to 16.9 MMBF. The decision maker could choose any of these alternatives in the final decision.

The Forest Plan states that young-growth regeneration harvests are not expected to contribute to the ASQ until the 4th decade (2030) of the Plan. At the same time, the Forest Plan does anticipate some young-growth volume to come from commercial thinning and other intermediate silvicultural treatments; see Forest Plan Table 3.13-9. In addition, in 2010, the Forest Service initiated a process to transition the timber program on the Tongass to young-growth management. In January 2013, the Tongass Forest Supervisor and Alaska Regional Forester signed the Leader's Intent letter to clarify the transition to young growth and actions planned over the next decade to achieve the intent (UDSA Forest Service Alaska Region, 2013). While acknowledging that a timber sale program based on old-growth harvest will be necessary to maintain the current industry, expertise and infrastructure, the Forest Service is committed to developing opportunities for Southeast Alaskan young growth in the interim. It is recognized that commercially thinning stands may be less economical than rotating them with even-aged or two-aged silvicultural systems, but the NFMA generally requires that a stand needs to have reached culmination of mean annual increment (CMAI), or peak growth before being rotated. None of the young-growth stands in the Big Thorne Project proposed for treatment have reached CMAI and therefore could not be rotated. In the meantime, treatments are being proposed as a way to provide some young-growth timber while also improving tree growth, forest health and wildlife habitat.

The decision to plan certain acreages of young-growth thinning under the Big Thorne Project was based on the information available in the feasibility report prepared by Tetra Tech for the Craig and Thorne Bay Ranger Districts. This report is available in the planning record. The DEIS Appendix D documents past harvest in the project area. As stands approach approximately 50 years old, they will be evaluated for commercial thinning opportunities. Extensive inventory of young-growth stands age 40 and older have recently been conducted across the Tongass. This information is being used to model future stand conditions and better define the future availability of young-growth timber. Please also see Timber: Transition Strategy and Silviculture: Young Growth and Alternative Design.

Please also see the discussion on Timber: Transition Strategy and Silviculture: Young Growth Management.

Soils

The commenter was concerned with slope instability and potential impacts to downslope resources.

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“Because much of the project area is on high gradient slopes with unstable soils, several landslides within the project area have impacted watersheds important to anadromous and resident fishes. Some of these landslides are naturally occurring, but others have been caused by or exacerbated by past logging and road activities. See DEIS at 3-257. Within the project area, landslides and mass instability events have occurred in the Sal Creek, Big Ratz and Steelhead watersheds. The USFS should be careful to avoid areas prone to landslides and persistent slope instability so as to minimize the risk to salmon and trout habitat.”

Forest Service Response:

Units are reviewed for steep and unstable slopes. All slopes greater than 72 percent gradient and many slopes over 50 percent gradient are reviewed for slope stability. In some cases, these areas are unstable and are deferred from harvest; see the soils section in the FEIS and the unit cards. At some sites, there is no evidence of instability and the site is recommended for timber harvest. When reviewing areas, potential impacts of accelerated erosion on downslope and downstream fish habitat, other beneficial uses of water, and other resources are evaluated. Recommendations are made to avoid adverse effects to other resources. The Forest Service follows the Forest Plan and best management practices to avoid harvesting and road construction on unstable slopes.

Subsistence

Several commenters had concerns about the effects of the project on subsistence.

“The Big Thorne project area is located at the main transportation hub of Prince of Wales Island. It is where citizens from Ketchikan and other places depart and do recreational and subsistence hunting, and commercially guided hunting businesses do the same thing. The project area is also a multiple use resource area for local residents that depend on area food resources. But the project area has been prioritized for only one use, logging, from the pulp mill days until now. A Big Thorne ten year sale does not balance multiple uses, it adds to the imbalance.”

“The proposed action would have extreme impacts on subsistence opportunities on Prince of Wales Island. The Forest Service is under a duty to protect wildlife and subsistence resources. NFMA 36 CFR 219.19 requires habitat be managed to maintain viable populations. The Forest Plan requires the “least adverse impact possible,” continuation of subsistence opportunities,⁵ to consider impacts on rural subsistence residents,⁶ seek to maintain abundance and distribution of resources necessary to meet subsistence needs,⁷; ANILCA Title VIII, Sections 810 and 811 requires careful consideration and avoidance of conflict with subsistence uses and needs— a requirement that is not merely procedural but also imposes a duty on the Forest Service to substantially protect subsistence opportunities. Rural residents must have reasonable access, which is not provided if the region is clearcut so badly that there are no deer to hunt.” The MIJSYA requirement for multiple-use management also mandates substantive protection of wildlife habitat and recreation. The DEIS does not reflect the on-the-ground knowledge and surveys done by Forest Service and ADFG, and therefore fails to serve its required role under NEPA.”

“The proposed sale targets the remaining essential winter deer habitat in an area heavily used by subsistence and sport hunters even though the project area currently does not meet Forest Plan goals for deer numbers.”

“An accurate analysis of carrying capacity is crucial for hunters and wolves on POW. Moreover, because of the interconnected road system over much of the island and the accessibility of the POW-associated islands by boat, even for project level analysis and especially for a project as large as Big Thorne, subsistence needs to be analyzed over that whole area. Because a reasonable analysis was not done for the Forest Plan, this must instead be done during project-level planning.”

Forest Service Response:

ANILCA Section 810 provides for the continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives, on Federal public lands. The act also mandates that customary and traditional subsistence uses of renewable resources shall be the priority consumptive uses of all such resources on the public lands of Alaska. Rural residents are provided a preference for the taking of subsistence resources on public lands. Section 810 (a)(3) of ANILCA requires that when a use, occupancy, or disposition of public lands may result in a significant possibility of a significant restriction, a determination must be made whether (1) such a restriction is necessary, consistent with sound management principles for the utilization of public lands, (2) the proposed activity involves the minimum amount of public lands necessary to accomplish the purposes of the use, and (3) reasonable steps will be taken to minimize adverse impacts on subsistence uses and resources resulting from the actions.

When making a decision for the Big Thorne Project, the Responsible Official will weigh the impacts of each alternative on economic and social factors such as: restoration, young-growth management, fisheries, mariculture, tourism, recreation, and subsistence, while seeking to provide a supply of timber from the Tongass, subject to applicable law, that meets market demand annually and for the planning cycle. The recreation section of the DEIS discuss the effects of the proposed project on recreation and guided hunting (also the recent Outfitter Guide EA). The Subsistence section of the EIS discusses the effects of the project on subsistence users, which does not include the residents of Ketchikan which is classed as a non-rural community.

The 1997 Forest Plan Final EIS (USDA Forest Service 1997) included a cumulative effects analysis of resource development on subsistence resources. Based on that analysis, the Forest Plan ROD (USDA Forest Service 2008) concluded that full implementation of the Forest Plan “may result in a significant restriction to subsistence use of deer due to the potential effects of projects on the abundance and distribution of these resources, and on competition for these resources”. It is not possible to substantially reduce timber harvest in one area and concentrate it in other areas without affecting subsistence resources and uses important to one or more rural communities (USDA Forest Service 1997).

For this reason, timber sale activities cannot completely avoid cumulative landscape effects to subsistence uses. Based on this evaluation and ANILCA definitions of significance, it was determined that, in combination with other past, present and reasonably foreseeable future actions, all of the alternatives (if implemented through

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project-level decisions and actions) may result in a significant restriction of subsistence uses of deer, due to potential effects on abundance and distribution, and on competition. This determination is based on an anticipated increase in human population, an associated increase in subsistence activities, and the capability of the habitat to produce deer. As a result of this finding, the Forest Service will notify the appropriate state agencies, local communities, the Southeast Alaska Federal Subsistence Regional Advisory Council, and State Fish and Game Advisory Committees.

Past timber harvest has altered the distribution of deer used by the communities in the vicinity of the Big Thorne Project, through changes in the distribution of habitat types and road development. Ongoing and foreseeable timber harvests and associated road construction, as well as other development, would contribute to these effects. The Big Thorne Project, in conjunction with past and foreseeable actions, may further alter the abundance or distribution of deer through reductions in carrying capacity. A request was made during the comment period that the deer habitat capability analysis should be done for “the whole area” including POW-associated islands that could be accessed by boat to obtain information of the deer available for wolves and subsistence. The North Central Prince of Wales biogeographic province is considered to be large enough to adequately assess the effects of the Big Thorne project on the deer and wolf populations that would be affected by the project and does include many of the islands surrounding the north end of the island. The extent of biogeographic province is shown in the Forest plan FEIS, Volume 1, p. 3-132, Figure 3.9.1.

Using the information described earlier in this section, the alternatives were evaluated for potential effects on subsistence uses and needs, as described above.

Necessary and Consistent with Sound Management of Public Lands: The alternatives proposed in this EIS have been examined to determine whether they are necessary and consistent with sound management of public lands. In this regard, the National Forest Management Act, the Alaska National Interest Lands Conservation Act, the Tongass Timber Reform Act, the Wilderness Act, the 2008 Forest Plan Amendment Final EIS, the Alaska State Forest Resources and Practices Act, and the Alaska Coastal Zone Management Program have been considered.

National Forest land management plans are required by the National Forest Management Act and must provide for the multiple-use and sustained yield of renewable forest resources in accordance with the Multiple-Use Sustained Yield Act of 1960. Multiple-use is defined as “the management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meets the needs of the American people” (36 CFR 219.3). The alternatives presented herein represent different ways of managing Tongass National Forest resources in combinations that are intended to meet the needs of the American people. The potential restrictions associated with each alternative are necessary and consistent with the sound management of public lands.

Amount of Public Land Necessary to Accomplish the Proposed Action: The amount of land necessary to implement each alternative is, considering sound multiple-use management of public lands, the minimum necessary to accomplish the purpose of that alternative. The entire forested portion of the Tongass is used by at least one rural

community for subsistence purposes for, at a minimum, deer hunting. It is not possible to avoid all of these areas in implementing resource use activities, such as timber harvesting and road construction, under any alternative, and attempting to reduce effects in some areas can mean increasing the use of others. The current Forest-wide Standards and Guidelines and LUD prescriptions provide for management or limit activities in many of the area's most important for subsistence uses, such as beaches and estuaries, and areas with high fish and wildlife habitat values.

Reasonable Steps to Minimize Adverse Impacts to Subsistence Uses and Resources: Subsistence use is addressed specifically in a 2008 Forest-wide Standards and Guidelines, and subsistence resources are covered by the Forest-wide Standards and Guidelines for wildlife, fish, riparian areas, and biological diversity, among others. Fish and wildlife habitat productivity would be maintained at the highest level possible under all alternatives, consistent with the overall multiple-use goals of the current Forest Plan, with improved protection under the Forest Plan.

Road construction associated with the past timber harvest has greatly improved access to many areas in the interior of Prince of Wales Island that would be virtually inaccessible by foot., altering the level of competition in some areas. The upgrading of the main routes that connect the main communities and the ferry terminal to a paved highway has also improved access. The ferry terminal in Hollis has daily trips to Ketchikan. The Coffman Cove ferry terminal is not currently in use but could provide future access to the communities of Petersburg and Wrangell. In addition, there is an extensive network of logging roads which provide access to many areas

Collectively, new proposed roads associated with the Big Thorne Project in addition to those resulting from other projects would temporarily improve access and reduce competition. Alternatives that would result in the greatest increase in the road system would be expected to result in the greatest increase in access to both subsistence and non-subsistence hunters. The greatest increase in road access would occur during project implementation when temporary and new roads are in use. Road access would decrease as road closures are applied, making them no longer available for use by motorized vehicles. Under all action alternatives there would be temporary restrictions in road access to subsistence during active logging operations as a safety precaution. As this project would occur over multiple years, all proposed timber operations, and temporary road closures would not occur simultaneously. Some National Forest System roads constructed for this project will be open up to five years for public uses such as firewood gathering and hunting and then put into storage. All alternatives would implement the Prince of Wales Island ATM, under which additional road closures would occur as funding allows, reducing access to subsistence resources over the long-term (USDA Forest Service 2009).

Timber harvest would also increase access to deer over the short term, due to the clearing of dense vegetation which makes them more visible to hunters. In a study of the influence of industrial logging on deer harvest on Prince of Wales Island, Brinkman et al. (2009) determined that hunters preferred habitats with open terrain, low vegetative cover, and high visibility, such as recent clearcuts or muskegs. Natural reestablishment of shrub and trees in the harvested areas reduces visibility and creates less desirable hunting conditions due to low visibility. Young-growth forest stands were least popular for hunting because

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they impeded the hunters' ability to see deer and were thought to contain fewer deer (Brinkman et al. 2009). Commercial thinning of young-growth stands, proposed under Alternatives 3, 4, and 5, may improve hunter access to deer by opening up these stands and creating forage for deer.

The current and projected hunter demand is in the DEIS, p. 3-237. The projected hunter demand (at stem exclusion) for action alternatives is expected to remain below 10 percent in two WAAs (1318 and 1319); ranging from 11.5 to 12.2 percent in WAA 1315; and 24.8 percent in WAA 1420. As a result, hunter success should remain at reasonably high levels in WAAs 1318 and 1319; decline in WAA 1315, and continue to be directly or indirectly affected through harvest restrictions or difficulty obtaining deer in WAA 1420. Table WLD-38 in the FEIS displays the relationship of the habitat capability with hunter demand, which is based on past hunter success. Habitat capability in WAAs 1318 and 1319 appears to be adequate to sustain the current levels of hunter demand which is less than 10 percent of habitat capability. Levels of deer harvest may decline in WAA 1315 since hunter demand is just over 10 percent of habitat capability. Due to past timber harvest, existing deer habitat capability in WAA 1420 may not be adequate to sustain the current levels of deer harvest since hunter demand is close to 20 percent of habitat capability. Over time, hunter success in WAA 1420 would be expected to decline due to reduced hunter efficiency and moderate difficulty in obtaining deer.

Timber: Ten Year Sale Contracts

Several commenters were concerned about the timber from the Big Thorne Project offered as a 10 year timber contract.

"We want to urge the Forest Service to honor the commitment to offer four 10-year timber sales each with an annual volume of 150 to 20 mmbf in addition to the regular timber sale program."

"But neither the TLMP nor this DEIS reflect a programmatic and site-specific analysis of the environmental and socioeconomic effects of implementing a long-term commitment."

"The decision to proceed with implementing Rey's sua sponte directives implicates problems with NFMA's public notice requirement for amendments, the Forest Service's responsibility to consider the significance of amendments and the consistency of the contract itself with TLMP. We think the Forest Service should rescind the DEIS based on these flaws or provide an adequate explanation in any further action related to the BTP."

"Planning a 10-year timber sale is not warranted by existing market demand. The project record does not suggest a need for large, long-term sources of timber. This was the norm during the pulp mill days, but is simply inappropriate for the modern situation."

"Appendix A to the DEIS also fails to explain how this ten-year commitment conforms to the TNF's procedures for implementing timber sales."

“The Forest Service needs to cease further planning or action on the long-term timber contracts because of the unlawful directive from Rey to utilize an unauthorized advisory committee in deciding when and where to site timber sales.”

Forest Service Response:

The previous administrations made a commitment to the forest products industry in Alaska for four, 10-year timber sale contracts to aid in stabilizing the existing industry infrastructure and to provide a basis for an integrated forest products industry. In 2009, four potential project areas were identified with the help of the Tongass Futures Roundtable. Fieldwork and NEPA analysis was initiated on the first two priority project areas, Big Thorne and Wrangell Island, in 2010. On March 4, 2011, the Alaska District Court issued a decision vacating the Tongass exemption to the 2001 Roadless Rule. The analysis on both these projects continues with redirected focus within only the roaded portions of the project areas.

The Forest Service no longer expects to implement the Big Thorne Project through a 10-year timber sale contract, although a multi-year timber sale is expected. The length of any timber sale contract will be based on the amount of the volume offered, which is unknown at this time. Direction in FSM 2400, Section 2431.14, limits the duration of timber sales - “There is a 10-year limit on the duration of timber sales (16 U.S.C. 472a (14) (c) and 36 CFR 223.31).

In addition to any larger sale(s) that may be offered in the Big Thorne project area, small sales may also be offered. The Forest Service still strives to meet the intent of the September 2008 letter, which is to have a fully integrated forest products industry in Southeast Alaska to help diversify and strengthen the local economy. Appendix A describes how timber demand is determined, and how timber harvest areas are identified for environmental analysis. Timber sales are planned and scheduled through Periodic Timber Sale Announcements (PTSAs). These PTSAs are sent to potential bidders and are posted on the Alaska Region public website.

The other two priority project areas identified in 2009 are pending until they can be absorbed into the normal program of work or additional funding becomes available. To date, no additional funding has been provided.

Timber: Concentrating Timber Sales on Prince of Wales Island

The commenter believes the Tongass Timber Sale program is purposely focused on the southern and central Tongass and specifically Prince of Wales Island and that this focus was not adequately covered by NEPA analysis done pursuant to the 1997 TLMP revision or the 2008 Amendment where harvest was to occur across the Forest.

“This project continues a trend of establishing intensive timber development on the southern and central Tongass and was not adequately covered by NEPA analysis done pursuant to the 1997 TLMP revision or the 2008 Amendment.”

Forest Service Response:

A discussion of why the Big Thorne Project was located in this area is included in

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Appendix A of the DEIS and FEIS. Timber harvest and contract sizes are planned according to the need of the various purchasers, the availability of suitable timber, and the location of the existing infrastructure. Since the closure of the Alaska Pulp Corporation (APC) sawmill in Sitka, most of the timber operations occur on the southern and central areas of the Tongass. The largest mill is located on Prince of Wales Island as well as many smaller mills. By locating the timber harvest in this area, the cost of transporting the timber is reduced, making the timber more economic. However, supplying the mills in the northern part of Southeast Alaska was also considered. Past projects in this area included the Iyouktug EIS (2008) and the Couverden EIS (2005). The Iyouktug project is located on the road system that connects to Hoonah, AK, where the Icy Straits mill and several smaller mills are operated. The decision on Couverden was specifically designed to provide small sales for the nearby operators located in Gustavus, AK. This project has also benefited those operators in Juneau. This volume has been offered in amounts that these operators would be interested and capable of purchasing. A discussion of why the Big Thorne Project was located in this area is included in Appendix A of the DEIS and FEIS.

The 1997 Forest Plan analysis (FEIS, p. 3-248 through 3-307) was based on the three administrative areas (Chatham, Stikine, and Ketchikan) in place at the time. This analysis took into consideration the closure of the APC pulp mill in 1993 and the shutdown of the KPC pulp mill in Forest Plan FEIS, Appendix M and in the errata. The 2008 Forest Plan Amendment FEIS (p. 3-336 to 3-350) reanalyzed the suitable and available timber. The Spectrum model (Forest Plan Final EIS, Volume II, Modeling and Analysis page B -1 to B-30.) used five physical geographic zones instead of the administrative areas. The Spectrum model sought to maximize present net values. A map titled “Potential Tongass Project Areas by Value per Acre of Suitable and Available in Roaded Areas” shows the pond log value per MBF was developed for the 2008 Forest Plan Amendment. This map shows that the further north the suitable timber is located, the lower the value which makes it less likely to offer a positive sale. This map, plus all information for the Spectrum model runs, is located in the Forest Plan planning record.

Timber: Alternate Uses for Non-sawtimber Products

Several comments requested that the Forest Service encourage utilization of wood products other than sawtimber.

“The FS should begin to consider ways to more fully support and utilize a broader spectrum of timber that is presently being harvested on public lands.”

“The US Forest Service documentation supporting the timber sale should include benefits that the sale offers to users of wood-based heating systems.”

“The US Forest Service should consider a prescription for “yum yarding” cull materials to road landings where cable and shovel logging are employed.”

“Finally, please also assess the economics and environmental and public health and safety effects of using second-growth for the purpose of stimulating a biomass fuel industry on POW. How many biomass boilers in addition to the Sitka facility have had safety issues associated with explosions? This should include a discussion of lost opportunity costs because the public investment in project

related to biomass energy is an investment in an energy source that may face competitive disadvantages from future regulation and competition from energy sources that truly merit federal renewable energy credits.”

Forest Service Response:

Logs with defect beyond sawtimber utilization specifications (utility) still incur costs to remove from the woods, and increase the logging costs. Export of utility and low-value logs is one way to increase utilization of harvested timber. Additionally, users of wood-based heating systems could offer to buy these materials from the timber sale purchaser if they desired. However, many users of wood-based heating systems may prefer to cut and gather their own firewood via road access following timber sale operations.

There is anecdotal evidence of the value to other users of having a deck of cull logs left at the landing once logging is complete.

In the absence of local or regional wood energy market, it is currently not feasible to assess the economic value of biomass at the project level. The financial analysis of this project does not account for non-market benefits, opportunity costs, individual values, or other values, benefits, and costs that are difficult or impossible to quantify.

The Alaska Region State & Private Forestry has been a key participant in the Alaska Wood Energy Development Task Group (AWEDTG), which was created to explore opportunities to increase the utilization of wood for energy and bio-fuels production in Alaska. A competitive grant program was created, and selected public and not-for-profit applicants received initial feasibility assessments for heating local facilities with wood. Renewable energy, forest restoration, and young-growth forest management are a few of the components of the transition strategy. In partnership with the State Division of Forestry and U.S. Coast Guard, work on the Southeast Alaska Biomass “Strategic Roadmap” begun in October 2012.

In Alaska, wood biomass heating systems have already been successfully installed in a number of non-industrial facilities. The first large non-industrial biomass system was commissioned in Craig, Alaska in April 2008. The system provides heat to the Craig elementary and middle schools and the nearby community pool. Using 4 to 5 thousand pounds of wood daily (local mill processing residues), the system saves the community ~\$85,000 annually in heating costs.

Some other operational systems include:

- Sealaska Corporation office building in Juneau, AK
- Tok School in Tok, AK
- Tanana washeteria in Tanana, AK
- Coffman Cove School in Coffman Cove, AK
- Ionia Community Center in Kasilof, AK
- District heating systems in Dot Lake, AK and Gulkana, AK
- USDA Forest Service, Southeast Alaska Visitor Information and Discovery Center in Ketchikan, AK

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- GSA Federal office building in Ketchikan, AK
- Delta Junction School in Delta Junction, AK
- U.S. Coast Guard facilities in Sitka

Several more biomass heating systems are currently in development, including:

- U.S. Coast Guard facilities in Ketchikan, and Kodiak
- Kenny Lake School in Kenny Lake, AK
- Fort Yukon School, Gymnasium, Vocational Education Center and Health Clinic, Fort Yukon, AK
- Thorne Bay School, Thorne Bay, AK and Tanana School in Tanana, AK
- Susitna Valley High School in Talkeetna, AK (2011 Woody Biomass Utilization Grant recipient)
- City of Nulato, AK - water plant/washeteria/school (2012 Woody Biomass Utilization Grant recipient)

Timber: Commercial Thinning

Several commenters were concerned with commercial thinning.

“The Final Preferred Action should also include the young growth commercial thinning units of Alternative 5. Adding these units and incorporating these recommendations into the Final Proposed Action Alternative will make Big Thorne a better project overall.”

Forest Service Response:

The comments about commercial thinning range from those in favor of it to those opposed to it. The availability of young growth on Prince of Wales Island that is mature and economic to harvest is currently insufficient to support a viable industry at this time. The young-growth harvest proposed in the Big Thorne Project would make additional young-growth volume available for offer allowing operators the opportunity to adjust, adapt, and develop markets for new products. Export and domestic processing policies and fluctuations in domestic and world markets for forest products will influence purchasers’ decisions to bid on young-growth volume.

Timber: Disproportionate Harvest of High-Volume Old-growth Forest

The commenter believes that a disproportionate amount of high-volume large-tree old growth is being harvested in the project and that by doing so the project violates TTRA.

“Further NEPA analysis needs to include a discussion and disclose data relevant to highgrading high volume large tree old-growth forests that provide optimum fish habitat and winter carrying capacity for deer. The TTRA directed the Forest Service to “eliminate the practice of harvesting a disproportionate amount of old-growth timber ... so that the proportion of volume harvested in these classes

within a contiguous management area does not exceed the proportion of volume currently represented by these classes within a management area.”

“In *NRDC v. U.S. Forest Service*, the court noted that there had not been adequate analysis regarding the disproportionate harvest of high-volume old-growth. [421 F.3d at 815]. Since the entirety of the Forest Service’s timber sale program is on POW, this particular DEIS needed to consider the NRDC court’s directives. Further NEPA analysis should address the following issues: (1) disclose the effect of continued highgrading across POW forests and (2) whether or how to lessen the cumulative impact of the practice and (3) assess potential impacts of reasonably foreseeable future highgrading. [Id.]”

Forest Service Response:

The reference to the disproportionate harvest in the Tongass Timber Reform Act (TTRA) is directly tied back to the two long-term contracts that were operating on the Tongass when the Act was passed in 1990. These contracts, Alaska Pulp Corporation (contract 12-11-010-1545) and Ketchikan Pulp Company (contract A10fs-1042) were 50-year timber harvest contracts and have been terminated. TTRA, Title III, Sec. 301 (c) (2), unilaterally modified these two contracts to “eliminate the practice of harvesting a disproportionate amount of old-growth timber by limiting the volume harvested over the rotation in volume classes 6 and 7, as defined in TLMP and supporting documents, so that the proportion of volume harvested in these classes within a contiguous management area does not exceed the proportion of volume currently represented by these classes within a management area.” A discussion on proportionality was included in the 1997 Forest Plan FEIS, but was deleted with the errata. This did not apply to independent sales and would not be required to those that will be offered from the Big Thorne Project. However, a comparison of the amount of large-tree POG within the project area and what is planned for harvest is shown in Table WLD-14, page 3-135 of the DEIS. Large-tree POG is now classed as Size Density, class SD67. This table shows that there are currently over 22,000 acres of large-tree POG in the project area. The four action alternatives propose harvest of between 5 and 9 percent of the existing total large-tree POG.

The lawsuit *NRDC v. U.S. Forest Service* involved the 1997 Forest Plan, and the court found a deficiency related to the cumulative effects of disproportionate high-volume logging, which is sometimes called “high grading”. This deficiency was corrected with the analysis done for the 2008 Forest Plan Amendment and discussed in the decision (ROD p. 45 through 46). The Forest-wide analysis for POG, high-volume POG, and large-tree POG is in the 2008 Forest Plan Amendment FEIS, Volume I, p. 3-139 to 3-204. A catalog of past projects on all lands including non-National Forest System lands is in 2008 Forest Plan Amendment FEIS, Volume II.

See responses to comments for Wildlife: Harvest of Productive Old Growth (POG) and Fragmentation.

Timber: Economics of Helicopter Yarding

Several comments expressed concern that individual units that are planned for helicopter yarding are not economic.

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“It is not clear to the “commenter” that clear cut logging with helicopters that are being proposed for this project can be done in an economic manner. ...We recommend using helicopter harvest prescriptions (HE50 and HE25) that were developed for the Slake Timber Sale, rather than the proposed helicopter clear cut harvesting.”

“Likely none of the helicopter clearcuts will be economically viable because the average selling value of the timber will be less than the cost of helicopter logging.”

Forest Service Response:

Some of the clearcut helicopter units’ prescriptions have been changed to a partial-harvest prescription based on yarding distance, timber volume and species composition. The marking guidelines call for retention of 50 percent or 75 percent of the existing basal area by unit. The trees selected for retention are of three types: crop trees, wildlife trees, and advanced or new regeneration trees. See Silviculture: Uneven-aged management harvest prescriptions response. The unit cards have the individual unit prescriptions and the responses under Unit-Specific in this appendix.

Timber: Economics of Young-growth Harvest

Several comments expressed concern about the economics of young-growth harvest and that their inclusion into the EIS reduces economics.

“...commercial thinning of young growth, recognizing that this stand treatment is uneconomical for them and the product of little or no value in the current Southeast Alaska market structure.”

“ incorporating commercial thinning of older young-growth stands into Alternative 3 appears contradictory to the principle concerns of Issue 1: financial efficiency and salability of the proposed project.”

“The DEIS should summarize the public and private costs of this industry over time and provide an estimate of the local employment opportunities.”

Forest Service Response:

Previous young-growth timber contracts have been awarded after successful bids or proposals. With the inclusion of young-growth timber units in this project, a transition to young-growth harvest can begin as described in the Leader’s Intent letter from January 2013 (UDSA Forest Service Alaska Region, 2013) and the Economic Analysis of Southeast Alaska (2010). While these acres may not be economic on their own, including these young-growth units at this time may create opportunities for markets and processing capabilities by completing the environmental analysis at this time. Additionally, some of these units may be economic when harvested adjacent to, or on the same road system as, old-growth units. See Timber: Individual unit economics response.

Timber: Preference for Small or Microsales

Several comments expressed preference for small or microsales instead of larger timber sales.

“Go back to small micro sales for our local mills.”

“A new DEIS should be completed that: considers the needs of small timber operators.”

“And, authentic local mills need small sales, not large ones, as proposed.”

“Keep what’s left for small operations and forget cutting like the good old pulp mill days.”

Forest Service Response:

Supplying a reliable economic supply of timber to large and small mills in Southeast Alaska is part of the goal of the Big Thorne Project. Generally, alternatives with a higher volume of timber harvest yield more options to create opportunities for a variety of purchasers. The harvest units from Big Thorne Project can be offered in a variety of timber sale and/or stewardship contract sizes, and will be determined on a yearly basis. The units within the Phase 2 area will be offered as small sales to meet the decision on the 2008 Forest Plan Amendment (ROD p. 65). The small sales program on Prince of Wales Island typically focuses on offerings with less-expensive conventional yarding methods and little to no road construction. Therefore, the extent of small sale opportunities correlates to the total harvest volume and more specifically to the volume proposed for harvest along existing roads using conventional logging systems. Construction of new roads in larger sales can also benefit small timber sale operators by increasing access to other roadside timber volume.

In the past, several projects have been completed where the purpose and need was specifically designed for small sales such as Goose Creek EA, Soda Nick EA, and Roadside EA. Roadside EA is a programmatic EA designed to offer microsales of dead or down trees along the Prince of Wales road system.

See Forest Plan: Management of Phase 2 lands, National Direction: Stewardship, and NEPA: Range of Alternatives responses.

Timber: Progress of Implementing the Transition Framework Strategy

A number of commenters expressed concern that there had been little progress made on the transition away from old-growth timber harvest and toward forest stewardship and young-growth management on the Tongass.

“I oppose such a sale because I find that this sale runs contrary to the Tongass Transition, a transition that the Forest Service clearly stated would move away from old growth timber management and instead focus on young growth utilization. The Tongass Transition was passed in 2010, yet it does not seem like much progress has been made the past two years...”

“This timber sale generally ignores the Forest Service’s own Tongass Transition Framework that describes an intentional and deliberate move away from old growth logging toward managing and harvesting young- timber, restoring local

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streams and forests, and helping communities build resilient and sustainable industries and economies.”

“This DEIS has no clear relationship to the Department of Agriculture's announced intent to quickly transition from old growth logging. The sale fails to commit to any specific stewardship or restoration work in the project area. Instead, it represents business as usual. We urge the Forest Service to start over on the DEIS to focus on this objective. At the very least, a wider range of alternatives should be included in the FEIS in order to provide choices representing stewardship.”

“Whatever happened to harvesting second growth?”

Forest Service Response:

In January 2013, the Regional Forester Beth Pendleton, Deputy Regional Forester Ruth Monahan, and Tongass Forest Supervisor Forrest Cole released “Leaders Intent: Forest Stewardship and Young Growth Management on the Tongass National Forest”. This paper clarifies the intent of the Tongass Leadership on the transition to young growth in Southeast Alaska, acknowledges the challenges currently faced, and outlines the actions necessary to move forward. This document and all of the ones referenced below have been placed in the project record. In addition to the commitment to the transition the Region has made, the Tongass has recently completed or has underway many projects involving young-growth timber. These include:

- The Tongass-wide young-growth study (**TWYGS**), was begun in 2002, and is expected to continue for 20-30 years, if funding and support continue. The results of TWYGS should increase our knowledge of the effects of thinning, inter-planting alder, pruning, girdling, and slash treatment for various objectives, including wildlife habitat improvement, and timber production in our young-growth stands. As of end of FY2011, one 5-year remeasurement had been conducted on all four TWYGS modules.
- The **Young-growth Wood Properties Study** was designed and implemented in 2003 to determine the effects of intermediate treatments (thinning) on wood quality. Stands ranging in age from 36 to 73 years that had thinned and unthinned areas were selected. Sample trees from paired plots (thinned and unthinned) were harvested and then in the ensuing lumber recovery study, log volume was related to recovered lumber volume by product grade. The results suggest that there are no significant differences in product recovery or value between thinned and unthinned trees in the manufacture of structural lumber products ([Lowell et al. 2012](#)).
- The **Commercial Thinning Study** (on POW) was awarded as an integrated resources service contract (IRSC) at the end of Fiscal Year 2008. This study looks at five different commercial thinning prescriptions that offer a range of potential treatments that could be used on the Tongass. The five different prescriptions were implemented at three replicates: near Harris River, in the Maybeso Experimental Forest, and near Naukati. The objectives of the study include, but are not limited to an assessment of how well-mechanized logging equipment can operate in Southeast Alaska, how the different prescriptions hold up in Southeast

Alaska's stormy weather, and what the understory response is after treatment.

- The PNW Forestry Science Lab (FSL) has made substantial progress in expanding our knowledge of the role of carbon on the Tongass N.F. Preliminary numbers for total carbon quantities (carbon stock) on the Forest are being calculated and include live biomass, coarse woody debris and soil carbon (forest floor and duff layers) (pers. comm. between Patricia Krosse and David D'Amore June 2012). Live biomass has been further refined into two broad age classes: old forest (100-300+ years) and young forest (0-100 years). Young forests are accreting carbon at an extremely fast rate, while older forests carbon accretion becomes more constant. As FSL continues to evaluate carbon levels on the TNF, they are considering differences in carbon storage by not only age class, but by harvest system. The objective of these studies is to evaluate the stock and flow of carbon with an ultimate understanding of how the forest functions as a carbon sink; thereby mitigating the impacts to increase CO₂ in the atmosphere due to climate change.
- **The Beck Report** (February 2009) was produced by The Beck Group under a contract awarded by The Nature Conservancy (TNC) to examine the changes that will be required within the forest products industry as the timber resource on Prince of Wales Island (POW), Alaska transitions to include harvesting of young-growth stands. The objective of the study was to examine the economics of harvesting and processing young-growth logs on POW, to determine the capital cost of any required equipment changes, and to evaluate the prospect of developing markets for non-lumber wood products produced from the young-growth timber resource. An emphasis of the report was biomass collection for the use in developing bio-fuels markets. The Beck Report assessed the costs of developing a biomass collection business, and assessed whether the logging residues could be utilized. In general, they found that the high cost of delivering logging residue makes it more likely that a manufacturer of wood pellets or briquettes, electrical cogeneration facilities, or central heating plants on Prince of Wales Island will most likely use mill residues. They found that mill residues are available at a much lower cost than logging residues.
- In September, 2009, a contract was awarded to Tetra Tech to do a **young growth feasibility study** on three watersheds on Prince of Wales Island. The purpose of the study is to assess the economic and physical feasibility of implementing watershed and riparian enhancement and restoration treatments and provide commercial by-products where allowed. Spatial and temporal stand modeling will help assess the cost trade-offs of thinning at various stand ages.
- **Economic Analysis of Southeast Alaska: Envisioning a Sustainable Economy with Thriving Communities** (May 2010). This report, by Susan Alexander et al. of the Alaska Region, was in response to the USDA Under Secretary for Natural Resources and Environment's (NRE) request to explore ways to accelerate the transition of the timber management program on the Tongass National Forest—and the timber industry in Southeast Alaska that is dependent on that program—away from its historical reliance on harvesting old-growth forest stands, and

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towards a program and industry based on the harvest of young-growth stands. Also, in the event that the transition were to result in the loss of jobs in the timber sector, the USDA NRE also asked for ideas on how such losses could be mitigated by Federal action to stimulate job creation in other sectors of the economy of Southeast Alaska. The report analyzed the financial, economic and levels of old-growth vs. young-growth harvest of varying transition length times. The report modeled several different scenarios on how and when to transition from old-growth harvest to young growth using the Spectrum forest plan model. Two of the conclusions the report came to: 1) Ending old-growth timber harvest after 5 or 10 years, even with considerable public investments in young-growth management, will not maintain a timber industry in Southeast Alaska; 2) Continued old-growth harvest outside of inventoried roadless areas can maintain the current level of timber harvest and jobs at a net profit.

- **Watershed Restoration Effectiveness Monitoring.** In 2009, the Tongass National Forest in cooperation with the Pacific Northwest Research Station began developing a strategy for monitoring the effectiveness of watershed restoration efforts. One component of watershed restoration is management of young-growth stands for future large-woody-debris recruitment to the stream. The draft study plan (Edwards et al. 2013) describes testing and refining a soil-geomorphic model that helps restoration managers determine where riparian young-growth treatments will be most successful. The study plan uses describes using both a retrospective approach and planned side-by-side study plots. The retrospective approach has been used for the last 2 years to gather data on a variety of riparian young-growth treatments.
- **Heceta Island Commercial Thin (IRTC).** In 2004, approximately 460 acres of young-growth stands were NEPA-cleared on Heceta Island. Questions about feasibility delayed the sale offering. In 2011, interest was expressed in the young-growth timber in the Heceta Island units, so the project was re-vamped in the summer of 2011. The prescription is a crown thinning, targeting 50 percent removal by basal area. The sale was awarded as an Integrated Resources Timber Contract (IRTC) to Alcan Forest Products. Harvest of the estimated 7.5 MMBF of young growth has not begun as of January 2013.
- **Dargon Point EA.** The Dargon Point EA was signed on February 19, 2013. The decision authorizes the harvest of around 2.5 MMBF of mature (60-70 years old) young-growth timber from a stand approximately 70 acres in size. The sale is planned for offer in Fiscal Year 2013
- **Big Thorne EIS.** The Big Thorne Project Alternatives 3, 4, and 5 include the commercial thinning of young-growth stands. The amount ranges from 2,081 and 2,572 acres within the project area.
- **Winter Harbor Stewardship.** The Winter Harbor stewardship project involved the commercial thinning of about 30 acres of young growth in the Winter Harbor area of Staney Creek. The treatment was conducted on both timber production uplands as well as in the 1,000-foot beach buffer. The beach buffer thinning was designed to promote old-growth stand characteristics.

- **Kosciusko Stewardship.** The Kosciusko Stewardship was one of the first stewardship contracts implemented in the area. The project included the commercial thinning of 50 acres of 53-year old spruce and hemlock young growth on Kosciusko Island. The CE for the project was signed in 2004 and the project advertised and awarded soon after to a sawmill operator local to the island. The logs and sawn wood from the project are being used in the construction of log cabin kits as well as to meet local demand.
- **Ocean Boulevard Wildlife Habitat Improvement Project.** This project was located in the False Island area of southeast Chichagof Island near Sitka. The purpose of the project was to improve wildlife habitat on up to 334 acres of young-growth timber. It included the commercial harvest of Sitka spruce and western hemlock from even-aged stands originating from harvests between 1967 and 1972.

Please also see Silviculture: Young Growth and Alternative Design and Regional Direction: Transition Framework.

Timber Economics: Competitive Bidding

Comment expressed concern there is not enough competition or bidders for sales offered from the project area.

“The DEIS needed to explain how planning on the large sale component of this project conforms to TLMP directives to “plan offerings to encourage competitive bidding.”

“Further NEPA analysis also needs to compare the competitive bidding from the small and micro-sales programs. How many regional sawmills are capable of successfully bidding and operating on sales ranging from micro-sales to large timber sales? The DEIS should also assess the disparity of bid values between larger and smaller mills on Prince of Wales Island.”

“We request that TNR [sic] re-run its FASTR model for project economics to reflect bid value differences between small and large volume sales.”

Forest Service Response:

Timber contracts offered by the Forest Service undergo a competitive bid process per Forest Service Handbook and Manual Direction (FSM 2400 and FSH 2409.18) and 36 CFR 223.83. Any company is allowed to bid on any timber contract given that they follow the appropriate bidding procedures. There may be a range of sizes of timber contracts to meet the needs of all potential bidders. The timing of these contracts will be determined based on the needs at the time of offer and in part based on the volume under contract from existing contracts on the Tongass.

There are multiple timber sale purchasers in Southeast Alaska capable of successfully bidding and operating on sales ranging from microsales of 50 MBF or less to larger timber sales. Viking Lumber Company remains the only mid-size mill now in the region. In addition to Viking Lumber Company, Alcan Forest Products LP is a purchaser of large timber sales on the Tongass. They do not have a processing facility on the Tongass, but must follow the current regional export policy. Therefore, they must sell the logs that

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cannot be exported to a processing facility in the State of Alaska. In addition, the Forest Service encourages new operators and timber purchasers to energize the economy and to begin the transition into young-growth management.

All timber sales offered from this project are planned to be offered for competitive bid. The size and number of timber sale offerings generated from this project will be determined at the time of implementation. Several units within the project area could be offered as small sales or provide volume for microsales. Timber sale purchases in the region are not limited to those with operating sawmills.

Smaller volume timber contracts usually receive higher bids in \$/MBF than larger contracts due to several factors. These factors include the lack of road construction and limited road maintenance needed, less-expensive equipment needed, the ability to target a certain species and size for a specialty market that commands a higher end product value, and the relatively small outlay of capital and chance of loss. However, these small contracts are possible because of the larger contractors who have built the roads for access and contribute maintenance funds for their upkeep when these operators are using them. The larger operators also support the necessary industries that help maintain equipment and provide supplies. If there are timber products in the small contract unable to be used by that purchaser, there may also be the opportunity depending on the product for the larger purchaser to buy that material.

Volume made available from the Big Thorne project area would contribute to a reliable and steady supply of timber that could promote entrepreneurship towards the creation of new forest products investment in the vicinity. Timber sales on Prince of Wales Island, with the exception of microsales, are advertised in the *Ketchikan Daily News*. Complete sale packages are also mailed to those on the Tongass Primary Bidder's list.

Timber Economics: Financial Efficiency Analysis

Commenters would like clarity on how the Forest Service determined the financial efficiency analysis in the DEIS. A commenter requested more accurate stand and species composition, as well as log grade and resultant value.

“The analysis of timber economics should be improved in a number of ways – it needs to account for export policy, account for the inefficiency of the large sale program and account for impacts to other valuable forest resources.”

“While it is unfortunate that a larger volume of old growth was not part of the proposed action, it appears that at least the financial return (or loss reduction) to the tax payers was part of the equation, as evidenced by the financial efficiency analysis in Table TSE-14.

“At the December 4th subsistence hearing in Craig, “a commenter” learned that the estimated values for all the action alternatives were positive. We believe this information qualifies as significant new information relevant to environmental concerns, and the Forest Service should immediately prepare a supplemental draft for public review that contains the recalculated figures, updated effects analysis for this alternative, and the "final" interagency old-growth reserve recommendations.”

“We recommend that you put a few cruise plots in the units to get a better idea of the timber values.” This is a comment that refers specifically to units: 595-005, 579-069, 578-074, 578-075, 578-078, 578-087, 580-092, 580-094, 580-095, 580-096, 580-098, 580-100, 580-104, 580-106, 580-107, 580-108, 580-109, 580-111, 580-112, 580-114, 597.1-117, 579-121, 579-122, 579-123, 586-125, 586-126, 586-130, 586-131, 586-135, 586-138, 585-140, 580-141, 580-142, 584-153, 584-154, 584-158, 584-159, 584-160, 584-161, 584-162, 584-168, 584-169, 584-171, 584-174, 584-175, 584-177, 584-179, 581-197, 581-200, 581-201, 581-202, 581-203, 595-363, 580-395, 595-402, 595-405, 595-407, 597.2-420, 597.2-421, 597.2-422, 580-439, 580-446, 580-450, 580-455, 580-465, 580-466, 580-473, 580-475, and 580-476.

“Incorporate the true costs of road construction and other subsidies and to discuss detrimental impacts to other resource users.”

“... further NEPA analysis should disclose the limitations of the recently adopted FASTR timber sale analysis tool. For example, deteriorating timber markets and rising fuel costs can have significant adverse effects on future economic viability of BTP alternatives. Does FASTR contemplate these known, persistent and long-term trends?”

Forest Service Response:

The FASTR spreadsheet uses the same logging costs and manufacturing costs developed for the Alaska Region timber sale appraisal program. Costs reflect production studies and data collected from timber sale purchasers in Southeast Alaska. These costs are built into the FASTR model and updated on a quarterly basis. Export of 50 percent of the total net sawlog volume for the project in hemlock and spruce, and 100 percent of the Alaska yellow-cedar is factored into the spreadsheet tool. Costs across action alternatives will fluctuate based on a number of variables or inputs including acres of harvest, silvicultural prescriptions, logging systems, length of haul and tow, cost of establishing and maintaining a camp, amount of road building, and post-harvest treatment of roads and timber stands. From these inputs, FASTR calculates Total Production Costs (cost of harvesting, cost of road construction and cost of manufacturing) and Total Selling Value (lumber and export log sales). Total Selling Value minus Total Production Costs equals the worth of the timber or Total Indicated Advertised Value.

Fluctuating timber market conditions and an increase or decrease in harvest costs have a direct effect on stumpage values during the time of timber offer. Use of the FASTR tool is a snapshot in time for when the tool was used. It is difficult to determine what market conditions will exist when timber from the Big Thorne Project is offered for sale or as a stewardship project. Because markets fluctuate, volume made available with the Big Thorne Project should allow the Forest Service to respond to those fluctuating conditions when packaging timber sales. At the time of actual sale or stewardship offer, a detailed appraisal will be conducted by established regional appraisal methodologies.

FASTR analyzes all the volume and costs for an alternative - not potential contract offerings - even though the timber will need to be offered in a variety of contracts to meet the Phase 2 constraints. The FASTR financial efficiency analysis uses a species mix of all

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commercial timber species across the project area, based on representative stand exam plots. In other words, the species composition of the harvest volume is the same as the species composition of the existing volume present in the harvest area by alternative, and is the same for all units. FASTR also uses a regional average to determine defect and timber quality, and uses just the high and low range of export possibilities. It is based on the Residual Value appraisal program instead of to measure values and costs, so it cannot be used to analyze past bid values in the manner requested.

Although the values have changed from the DEIS due to the changes in the units between DEIS and FEIS, FASTR is designed to provide a ‘snapshot-in-time’ of the relative values of the alternatives. No updated run was done for the subsistence hearing in Craig and it might be that someone referred to the appraisal being positive if only the most economic units were offered from an alternative. This is still true although one alternative still appraises negative. A timber cruise will be performed before a timber sale or stewardship contract is offered for bid, using the standards in the Timber Cruising Forest Service Handbook (FSH 2409.12) and this information will be used in the timber appraisal before offered as a contract. An appraisal will be analyzed at the time of offer for a timber sale or stewardship project using cruise information which will more accurately depict the volume, species composition, and the amount of defect and updated road costs if needed.

The planned harvest units in the Logging System and Transportation Analysis (LSTA) were not selected based on species composition. Even-aged management prescriptions require removal of all merchantable volume regardless of species. Uneven-aged management prescriptions were also analyzed with a proportionate harvest of all species, and marking guidelines used for implementation will be designed for each unit in a way that meets silvicultural objectives.

For more information on costs associated with the Big Thorne transportation system including road construction, road reconstruction, and road maintenance, refer to the Transportation section of the FEIS and responses to comments under Transportation.

Timber Economics: Forest Service Administrative Costs

Commenters would like clarity on the Forest Service administrative cost information.

“This DEIS continues to use outdated cost figures of \$23/MBF for sale preparation, \$9/MBF for sale administration, and \$28/MBF for engineering support.”

“...continued reliance on the 1990s \$101/MBF cost estimate is unreasonable. Further NEPA analysis should scrap the \$101 MBF figure and disclose actual project and programmatic costs.”

“This DEIS failed to fully disclose and discuss actual public expenditures on this project.”

“The Forest Service should rescind this DEIS and evaluate actual program and project costs.”

“The underestimation of costs yields the same result as overinflated estimates of a project’s economic benefits it impairs a fair consideration of adverse

environmental impacts by the decisionmaker and skews the public's evaluation of a project. [Hughes River Watershed Conservancy, 81 F.3d at 446].”

“In our TLMP appeal we pointed out that the Forest Service had not provided any documentation or support for the assumption that agency timber sale program costs amounted to the \$101/MBF public cost disclosed in this DEIS.”

“We disagree with the characterization of sunk costs and request further explanation.”

“The Big Thorne DEIS uses out dated numbers that have been used since 1999 to calculate the cost/benefit analysis: TSE-14.”

“The TNF also ignored relevant data showing that the administrative cost for this project is at least ten times as high as projected.

“The cost figures provided for NEPA preparation are misleading.”

Forest Service Response:

The Forest Service costs/MBF estimates used are averages from the Alaska Region's budget allocation process. In the Big Thorne DEIS, the estimated Forest Service costs and estimated revenues (indicated advertised rate) are presented in Table TSE-14, DEIS page 3-36 using the costs available at that time. A review of the budget information sent in response to the FOIA request revealed that the costs considered in the reference attached to the comment included costs other than those associated with timber harvest contracts.

Average Forest Service costs were updated and approved by the Regional Forester on January 24, 2013. These costs used summarized and averaged data from fiscal years 2010, 2011 and 2012. The current values are \$20.78/MBF for projected sale preparation cost, \$12.18/MBF for projected sale administration cost, and \$22.67/MBF for engineering support cost. These costs have been updated in the FEIS, Table TSE-14.

An average cost of \$47.97/MBF for environmental analysis and documentation (NEPA) is used by FASTR at the initial timber project planning stage (Gate 1) to provide the responsible official with a relative estimate of projected costs associated with performing NEPA (Gate 2). This cost is disclosed in the FEIS, but this cost has already been realized with the field reconnaissance, and required analysis and documentation needed to produce the environmental documents. Any costs for administrative appeals or litigation are not included or estimated, which would result in higher costs/MBF. Costs multipliers (\$/MBF) are based on net sawlog estimates of each alternative, and FASTR only calculates Forest Service costs based on current estimates of volume and acres made available across action alternatives.

Because the Big Thorne Project is at Gate 2, cost estimates at Gate 1 for NEPA analysis are not represented in the FASTR outputs or in Table TSE-14 of the DEIS, as this figure is considered already spent. Regardless of action alternative, this cost remains constant as it is based on the alternative proposing the largest amount of volume (the cost of performing NEPA will be the same for the alternative with the lowest amount of volume as the alternative with the largest amount of volume proposed). The estimated cost represents the estimated Forest Service costs at the project planning stage.

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Transportation: Effects of Temporary Roads

Some commenters were concerned the designation of temporary roads was used to bypass the requirements of NEPA analysis.

“Please consider the difference between a temporary road, and a road in intermittent storage, and a road for one-time use. Are the sediment impacts greater of temporary roads due to less careful design? Do they fill wetlands (and if so, have all practicable alternatives been ruled out)? How are the impacts different for temporary roads? If the Forest Service is going to undertake this new strategy, then please provide the warrant for it.”

“Further, there is the problem that a “temporary” road may be identical on the ground to a system road. The EIS however simply makes a blanket, categorical assumption that temporary roads have less impact, cost less, and quickly recover. Without site-specific consideration, the public and decision-maker are left in the dark as to what any of these roads will look like.”

Forest Service Response:

A temporary road is defined as a road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas (36 CFR 212.1). This does not mean the effects are not analyzed or considered throughout the EIS. The EIS does not categorically assume that temporary roads have less impact or “quickly recover.”

Temporary road locations on wetlands, including site-specific avoidance measures, are described in unit cards. The effects of temporary roads are disclosed and analyzed by resource in Chapter 3 of the DEIS and the FEIS. The following resources specifically analyze effects of temporary roads. Page and/or table number references are given for the DEIS; corresponding information is also presented in the FEIS.

Wildlife

Road Density below 1,200 feet Elevation on NFS Lands Only after Implementation of the Alternatives DEIS Table WLD-24.

Cumulative Road Density on All Ownerships Below 1,200 Feet Elevation by Alternative, DEIS Table WLD-26.

Direct, indirect and cumulative effects to deer habitat capability including effects of temporary roads for each alternative are discussed in the DEIS on pages 3-174 to 3-186.

Road Density at All Elevations on NFS Lands Only after Implementation of the Alternatives, DEIS Table WLD-28.

Cumulative Road Density on All Ownerships at All Elevations by Alternative, DEIS Table WLD-30.

Direct, indirect and cumulative effects to American Marten including effects of temporary roads for each alternative are discussed in the DEIS on pages 3-186 to 3-195.

Direct, indirect and cumulative effects to Spruce Grouse including effects of temporary roads for each alternative are discussed in the DEIS on pages 3-216 to 3-217.

Subsistence

Access analysis DEIS page 3-229 to 3-230.

Direct, indirect and cumulative effects to Subsistence including temporary roads, DEIS pages 3-235 to 3-241.

Watersheds

Existing Roads in Subwatersheds Affected by Big Thorne Project Alternatives DEIS Table WTR-4.

Proposed road construction by alternative DEIS Table WTR-7.

Proposed road-stream crossings by alternative DEIS Table WTR-8.

Cumulative percent road area by alternative DEIS Table WTR-10.

Direct, indirect and cumulative effects including temporary roads for each alternative are discussed in the DEIS on pages 3-289 to 3-299.

Soils

Resource Analysis Area, DEIS page 3-308.

Affected Environment, DEIS page 3-309.

Existing Soil Disturbance in Big Thorne Project Area DEIS Table SOIL-1.

Management-related Disturbances, Road Construction DEIS page 3-312.

Direct, indirect and cumulative effects including temporary roads for each alternative are discussed in the DEIS on pages 3-313 to 3-323.

Estimated Acres of Cumulative Detrimental Soil Disturbance by Alternative, DEIS Table SOIL-4.

Estimated Acres of Detrimental Soil Conditions from Implementation of the Alternatives, DEIS Table SOIL-4.

Fisheries

Stream Crossings, DEIS page 3-336.

Fish passage DEIS page 3-338.

Fisheries pages DEIS 3-342, 3-344.

Fish Passage in the Project Area by Subwatershed, DEIS Table FISH-6.

Wetlands

Road Construction, DEIS page 3-353.

Road and Timber Harvesting Impacts on Wetland Types by Action Alternative, DEIS Table WET-2.

Estimated Acres of Cumulative (Existing, Project, and Foreseeable) Wetland Impacts from Harvesting by Alternative, DEIS Table WET-3.

Direct, indirect and cumulative effects including temporary roads for each alternative are

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discussed in the DEIS on pages 3-356 to 3-364.

Invasive Plants

Methodology, invasive plant surveys, DEIS pages 3-389 to 3-390.

Environmental Consequences, DEIS page 3-392.

Effects of Roads, DEIS pages 3-394 to 3-400

Summary of Acres Harvested, Road Construction, Number of Stream Crossings, and Acres of Rock Quarry as a result of the Big Thorne Project, DEIS Table INV-4.

Summary of Cumulative Acres Harvested, Road Construction, Number of Stream Crossings, and Acres of Rock Quarry as a result of the Big Thorne Project, DEIS Table INV-6.

Transportation

Units of Measure, DEIS page 3-425.

New Temporary Roads, DEIS page 4-342.

Big Thorne Area Existing and Proposed Roads, DEIS Table TRAN-3.

Big Thorne Road Development Costs, DEIS Table TRAN-4.

Estimated Costs of Road Storage and Decommissioning, DEIS Table TRAN-5.

Direct, indirect and cumulative effects including temporary roads for each alternative are discussed in the DEIS on pages 3-433 to 3-441.

Irreversible and Irretrievable Commitments of Resources

Road construction and rock quarries, DEIS page 3-518.

Transportation: Leave Roads Open

Some commenters would like to see roads left open to provide public access.

“These roads should remain open after timber harvest to allow the public to access firewood, hiking, hunting, berry picking, and other personal, subsistence, and recreational activities.”

“More roads are needed to access firewood and deer for local subsistence especially with so many FS roads being water-barred and closed to the public access.”

Forest Service Response:

National Forest System roads constructed to support the Big Thorne Project are planned to remain open up to 5 years after harvest activities for administrative access and incidental public use unless they are identified as a high priority to store to address resource concerns. Temporary roads constructed to support the Big Thorne Project are decommissioned as part of any timber sale.

Transportation: Minimum Road Systems

Some commenters were concerned the proposed action is not compatible with a minimum road system.

“First, the proposed action is not compatible with a minimum road system.”

Forest Service Response:

36 CFR 212.5(b)(1) requires the responsible official on each National Forest to identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan, to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

The effects of roads are analyzed throughout the document. The road system proposed in the FEIS is recommended as the minimum needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.

Alternative 5 addresses watershed effects (Issue 4) and other issues by minimizing road construction, road-stream crossings, ground-based logging, and reducing harvest in watersheds with high levels of harvest within the past 30 years.

In the decision for this project, the decision maker will decide which roads are built, reconstructed, or would be open or closed (and placed into storage). National Forest System roads will be closed or put into storage or kept open as determined in the ROD. If a change was determined to be necessary, a new NEPA analysis/decision would have to occur. Temporary road decommissioning will be part of any timber sale contract.

Transportation: Relationship to Access Travel Management (ATM) Plan

Some commenters requested clarification as to the relationship between the Big Thorne Project and the Prince of Wales Access and Travel Management Plan.

“Third, consistency with the POW ATM plan is not addressed. The Big Thorne travel management plan simply incorporates the POW ATM Decision Notice (2009). The POW ATM EA however did not include this project within its realm of “other planning efforts” on the road system. The proposed project is a modification to the ATM plan. That timber harvest would be concentrated in this manner in this place was not foreseen at the time the ATM decision was made. The two plans appear to be at odds in several respects. In general, the ATM EA and decision assumes a greater amount of monitoring and maintenance on closed roads, than does the project. The ATM plan doesn’t include these new subdivisions of ML1 roads. The project file does not appear to contain any road-by-road consideration of consistency with the ATM plan. The project file does not appear to contain a USFS motor vehicle use map for the project area. Does such a map exist?”

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“The DEIS states that the proposed action would not change any of the OBMLs and RMOs in the Prince of Wales ATM. However, there is no road-by-road analysis to support this conclusion. The DEIS says that the proposed action and road maintenance are effectively unrelated actions, and that, “[a]ny effects from ongoing road maintenance and reconditioning work are included in the cumulative effects analysis for this project.”

Forest Service Response:

The relationship of the Big Thorne Project and the POW ATM Plan is discussed in the FEIS Chapter 1 and in the Transportation Resource Report. No changes are being proposed to the Objective Maintenance Level and Road Management Objectives designated in the Prince of Wales ATM. Effects of roads are analyzed in the respective resource section.

The POW ATM decision does not preclude road construction for other projects.

See response Transportation: Road Monitoring Requirements – Project Related.

A 2013 Motor Vehicle Use map of the project area has been added to the project record.

The objective maintenance levels for roads are shown on the road cards and in the Transportation Resource Report.

Road maintenance is done through separate service contracts to reduce the backlog of deferred maintenance, recondition roads to comply with best management practices, and maintain the existing infrastructure for National Forest management activities. The timing of this work may coincide with this project's analysis, but is not part of the proposed action or alternatives being considered. Federal law only allows Forest road funds to be spent on National Forest System roads for the purpose of construction and maintenance (23 USC 205 (a)).

Transportation: Road Cards

Some commenters had expressed concerns that the road cards seemed incomplete with narratives not matching the maps, incorrect stream crossings listed, narratives not matching road condition survey data, and does not provide adequate site-specific information. Commenters requested that the road cards are corrected in the FEIS and that they contain site-specific information.

“Perhaps for this reason the road cards are very heavy on the boilerplate. The reader’s initial impression of redundancy in the narrative, after closer examination, turns out to be apt. Rote repetition of a paragraph of vague disclaimers is not adequate site-specific analysis under NEPA. What is being proposed here is a massive project — correspondingly, the amount of location-specific, interdisciplinary review also needs to be massive.

The boiler-plate nature of the cards suggest that perhaps little or no actual review has gone into the location-specific issues by the resource specialists. Our admittedly incomplete review of the project record didn’t find much evidence of unit-specific input or consideration. The process the Forest Service used to integrate resource specialist concerns into unit and road design is not clear.”

“Some of the road cards appear to have been sloppily put together, with narratives not matching maps, for instance. Please ensure high quality of all road and unit cards in the FEIS. Again, we are concerned this is a manifestation of the project simply over-taxing the staff.”

“We are concerned with the large number of stream crossings that are shown on road card maps, but that are not reflected in the narrative information on stream crossings. It seems likely that the DEIS analysis, which all hinges on numbers of stream crossings, may have understated the number of proposed stream crossings. It also may be that the RCS data is missing a large number of fish streams, which would be a(nother) danger sign about the quality of the Road Condition information. Whatever the case, please correct these errors.”

“The road cards in almost every (every?) instance say that, for stream crossings, “GIS stream locations do not always match the RCS data” and that additional surveys “may” be conducted. Is this the case for every single road?”

Forest Service Response:

Additional road surveys were completed and the road cards narratives have been updated for the FEIS. Most of the proposed roads have been surveyed for potential stream crossings and drainage needs. If any additional stream crossings are identified during implementation, then a fish biologist or a hydrologist will be consulted to determine appropriate crossing structures and location prior to construction and documented in a change analysis. All fish stream crossings will be installed under current timing restrictions and concurrence with the State of Alaska will be solicited prior to starting any construction. All appropriate BMPs will be applied.

RCS data is measured linearly along the roadway using a variety of methods including hip chains, digital measuring tools, digital measuring instruments on vehicles, etc. This RCS data is projected into GIS using linear referencing tools. GIS stream locations are GPS locations or digitized locations. The two methods may not always achieve the same spatial location. Any discrepancies between the road map and the narrative will be explained in the Introduction to the Road Cards.

Every stream crossing is surveyed prior to implementation to determine the appropriate crossing structure.

Transportation: Road Closure Commitment/Maintenance as Mitigation

Some commenters were concerned that the planned road closures would not be implemented.

“The EIS conclusion that proper maintenance will adequately mitigate impacts is misleading because, in the context of a maintenance backlog, funding to implement mitigation cannot reasonably be foreseen to exist.”

“Please make an affirmative commitment that the required road storage and decommissioning will be done. Please also consider the possibility that funding

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will prevent or stall mitigation measures, and take a hard look at the environmental consequences of that potential eventuality.”

Forest Service Response:

The reference to road closures as mitigation reflects the reduction of road miles for motorized access to black bears and furbearers. National Forest System roads constructed to support the Big Thorne Project are planned to remain open up to 5 years after harvest activities for administrative access and incidental public use unless they are identified as high priority to store sooner to address resource concerns.

Temporary roads constructed to support the Big Thorne Project are decommissioned as part of any timber sale. They must be decommissioned prior to close-out of the timber sale contract. The timber sale purchaser will pay the cost to decommission the roads.

The storage of National Forest System (NFS) roads planned for closure through the Big Thorne Project will be funded through timber sales. All NFS roads planned for closure will occur during the life of any timber sales sold through the Big Thorne Project.

The POW ATM decision closed many of the roads in the project area. The roads open to motorized vehicles are shown on the Motor Vehicle Use Map (MVUM), a copy has been included in the project record. Since 2007, 391 miles of NFS roads on Prince of Wales have been placed into storage. These roads will be removed from the MVUM map and motor vehicle traffic will be prohibited.

Transportation: Road Construction to Lower Standard

Some commenters were concerned that some roads would be constructed to a lower standard and pose a greater environmental cost.

“We are concerned that roads constructed to lower standards may impose greater environmental costs. With substandard surfacing and drainage, these roads would have greater sedimentation and fish passage effects than a similar amount of system road. At the same time, temporary roads can be narrower and can sometimes be built to enable wetlands to recover. There is a balance that needs to be struck. Please document how this was done in the EIS.”

Forest Service Response:

No road will be constructed with substandard surface or drainage. All road construction will meet best management practices (BMPs). BMPs for temporary roads are listed on the unit cards, for example, “During construction of temporary roads implement BMPs 12.17, 13.10, 13.11, 13.16, 14.3, and 14.5”. BMPs for system roads are listed on the road cards, for example, “During construction follow BMPs 14.6, 14.7, 14.12, 14.14, 14.17, and 14.19”.

Transportation: Road Costs and Public Works Costs

Some commenters wanted the public works and other costs associated with road construction and maintenance disclosed.

“Our scoping comments requested that the DEIS provide information regarding the costs of logging road construction and maintenance borne by public works road contracting and other sources. The DEIS did not disclose these significant public costs associated. The cost disclosures should include the estimated cost of building, reconstructing and maintaining roads as an administrative cost rather than a logging cost. The DEIS states that “engineering support consists of planning and timber sale contract administration activities associated with new facility and road construction, use of existing facilities and road maintenance” and that the public cost of these activities is \$3 million for the preferred alternative [DEIS at 3- 36]. But the DEIS also provides further road cost information in its analysis of timber sale purchaser costs of nearly \$6 million. [DEIS at 3-30].”

Forest Service Response:

At this time, there are no foreseeable plans for road construction in the project area other than those disclosed in the FEIS and there are no congressional appropriations slated for the Big Thorne Project. At this time, there are also no public works contracts for construction, reconstruction, repair or maintenance associated with the Big Thorne Project.

Estimated road construction and maintenance costs by alternative are displayed in the transportation section of Chapter 3 of the FEIS. Road construction costs by MBF are included in Table 2-1.

Transportation: Road Decommissioning

Some commenters were concerned the planned road decommissioning would not occur.

“Despite the project area already exceeding the number of road miles optimal for deer and wolves, even more roads would be built; this is made even more egregious in that road decommissioning would not even be funded as part of the plan, instead it would only occur IF funding is available.”

“In the FEIS, please discuss and consider, at a site-specific level, the proposed mitigation in terms of road decommissioning. Specifically:

- when will roads be decommissioned?;
- How will they be decommissioned? (e.g. stored, obliterated, will any culverts be left in place, what spacing will be used for waterbars, etc.)
- Consider road maintenance funding issues, including:

Whether road maintenance budgets would be adequate to fulfill the envisioned mitigation;

Whether USFS, or the contractor, would be responsible for road decommissioning;

- The cumulative effects of this and past and future projects on decommissioning (e.g., for a given road, when is the next foreseeable use of that road, for example for thinning or restoration actions)”

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Forest Service Response:

Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1) Each road segment is reviewed to determine the appropriate decommissioning strategy.

Roads that will be decommissioned in the Big Thorne Project are any temporary roads constructed through timber sales. These temporary roads will be decommissioned as part of any timber sale contract. They must be decommissioned prior to close out of the timber sale contract. The timber sale purchaser will pay the cost to decommission the roads.

When roads are decommissioned all drainage structures will be removed. Waterbars and cross drain spacing is determined on an as needed basis. Generally waterbars are placed 150 to 200 feet apart depending on road gradient. Road access is blocked to prevent motorized vehicle access. Other measures may be incorporated as necessary.

Temporary roads are planned for a single use and foreseeable use of the road is not anticipated.

Transportation: Roads Do Not Meet Current Standards

Some commenters were concerned the roads within the project area not meeting the required standards.

“Forest Service roads must comply with substantive minimum regulations regarding environmental and safety standards. Specifically, 36 CFR 212, 251 and 295; FSM 7700 et seq.; FSH 7700; TLMP S&Gs (pp.4-80 et seq.); AASHTO and OSHA standards; Specs for Construction of Roads and Bridges on Federal Highway Projects, FP-03; the Clean Water Act §404 and 33 CFR 323.4(a); Clean Water Act Stormwater Permitting; and EO 11990, among others. The Forest Service must maintain roads in a condition to safely accommodate intended use and in accordance with maintenance criteria documented in the road management objectives. The TLMP imposes basic minimum standards, and encompasses other BMPs.

Existing roads in the project area are not in compliance with these standards. Rather than making headway at correcting problems, the Forest Service is falling further behind an ever-growing backlog of maintenance. These are substantive violations of bedrock environmental statutes, and should be taken seriously.”

“The TLMP requires operation and maintenance of NFS roads to meet RMOs and other minimum conditions. TRAN6 (road maintenance). Yet, there are hundreds of miles of road on the Tongass that do not meet their RMOs and other minimum conditions.”

Forest Service Response:

The EIS discusses the compliance of roads with State and Federal regulations and policies in Chapter 1 and Chapter 3 resource effects sections.

Road maintenance budgets have not kept pace with the requirements of the road system on Prince of Wales Island. The road maintenance program is ongoing throughout Prince

of Wales to recondition roads to comply with BMPs and maintain the existing infrastructure. Since 2007, 391 miles of NFS roads on Prince of Wales have been placed into storage. This has allowed maintenance funds to be concentrated on the open road system and address annual maintenance needs and emergency repairs.

Maintenance and reconditioning of existing NFS roads is an ongoing process that occurs on a periodic basis. Annual maintenance is work performed to maintain serviceability, or repair failures during the year in which they occur. This includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998). Common annual maintenance items include brushing, road grading, ditching, culvert repairs, and road surface repairs. This work is ongoing throughout Prince of Wales on a schedule to meet the needs of the transportation system. The Purpose and Need of the Prince of Wales ATM stated, “Provide a Forest transportation system that would be economically feasible given the reduced road maintenance budgets (Forest Plan 4-103)”.

The road maintenance program has been actively working to meet the required standards. Road maintenance needs are dynamic; what is up to standard today may need work tomorrow due to weather, wear or other occurrences. The road maintenance budget for Prince of Wales Island has been around \$500,000 per year for the last 2 years. Road maintenance includes any expenditure in the repair or upkeep of a road necessary to perpetuate the road and provide for its safe use.

Any timber sale implemented through the Big Thorne EIS will require the purchaser to perform road maintenance commensurate with their use.

Transportation: Road Funding Sources, Road Maintenance, Purchaser Election Option

Some commenters were concerned with funding sources for road maintenance and construction and how funds were allocated. Also requested is information as to what extent are timber sale purchasers required to bear the cost of maintenance on project roads.

“The TNF has also recently received considerable appropriations outside of its capital road maintenance budget. In 2009 and 2010 the TNF spent 13.2 million in American Reinvestment and Recovery funds. [FY 2009 and 2010 TNF Tracking Summary]. In 2011, the TNF spent 43.6 million in federal highway funds. [FY 2011. TNF Tracking Summary]. The TNF also plans to spend in excess of \$3 million dollars from its Capital Improvement and Maintenance Roads (CMRD) budget category on road reconstruction for “second growth management” in southern Tongass areas with ongoing old-growth timber sales and no commercially viable second-growth. [Alaska Region. 2012].

Therefore, further NEPA analysis should provide detailed information regarding how the TNF spent this money. The DEIS should disclose costs associated with awards for new road construction to support this project. Second, the DEIS should

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include a summary of the individual annual maintenance plans for roads used in the project area for the BTP and for recent timber sales [FSH 2509.22; BMP 14.20 Road Maintenance]. To what extent does the timber sale purchaser bear the costs of maintenance? Please summarize how individual maintenance plans done for roads associated with the recent Logjam project allocated these costs. Was there a cost-sharing arrangement? If so, what determinations were made with regard to the commensurate share of timber purchasers, the Forest Service and other commercial users? [Id.]. The Alaska Region also has a purchaser election option which allocates funds to timber sale purchasers for some projects. [Id.] Please explain this practice and how it works on POW. Finally, please disclose all pre-haul maintenance that has been or is being done in the project area.”

Forest Service Response:

The Transportation section of Chapter 3 includes the estimated cost of road construction and maintenance and this information is also available in other NEPA documents and in existing road maintenance contracts. Information for past capital improvement projects can be obtained through the FOIA process. This maintenance is done to keep the roads at a level for public use and to prevent resource damage. Maintenance plans have been added to the project record.

At this time, there are no public works contracts for construction, reconstruction, repair or maintenance associated with the Big Thorne Project although ongoing maintenance within the project area may occur. See response to Transportation: Road costs and public works costs.

The timber sale purchaser will be required to maintain roads used for the contract in a satisfactory condition commensurate with their use (36 CFR 212.5 (d)). Work items for this include drainage repairs, brushing, road prism repairs, and road blading. In addition, road maintenance deposits will be collected for surface rock replacement over haul routes. The volume of timber over any given route determines the required deposit amount. For the timber harvest contracts from the Logjam project, the purchaser bore the cost of road maintenance for the roads used for the units involved in each contract. There was no cost-sharing with other commercial users.

In regards to the purchaser election option, there are no funds allocated to timber purchasers for projects. The commenter may be referring to 36 CFR 223.84, Small business bid form provisions on sales with specified road construction.

No pre-haul maintenance has been done or is being done in the project area. Pre-haul maintenance would be completed as part of any timber sale contract awarded and be the responsibility of the purchaser.

Transportation: Road Maintenance Backlog

Commenters are requesting the amount of maintenance backlog in the project area.

“Please quantify the maintenance backlog as it relates to the project.”

Forest Service Response:

Maintenance and reconditioning of existing NFS roads is an ongoing process that occurs

on a periodic basis. Annual maintenance is work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998) Common annual maintenance items include brushing, road grading, ditching, culvert repairs, and road surface repairs. This work is ongoing throughout Prince of Wales on a schedule to meet the needs of the transportation system.

The maintenance items outstanding within the Big Thorne Project include the work items required to place open roads into storage. There are presently 85 miles designated for storage and 17 miles for decommissioning. The estimated cost per mile for road storage or decommissioning is \$4,000 per mile (based on recent contract bid prices). With 102 miles remaining the estimated base price is \$408,000.

The cost for annual road maintenance can be estimated by the road maintenance level. The estimated cost by maintenance level comes from the Tongass National Forest Forest-Level Roads Analysis. The costs converted to 2012 dollars are \$1005/mile for maintenance level 2 roads and \$2558/mile for maintenance level 3 roads. To maintain the project area roads to the prescribed maintenance level would cost \$314,644.

Maintenance Level	Miles	Annual Maintenance Cost
2	140	\$140,700
3	68	\$173,944

The cost for repair and replacement of red pipes within the Big Thorne project are highly variable depending on the site. There are 155 red fish pipes (Table FISH-6) within the project area. 42 of these are planned for removal through road storage actions leaving 113 for replacement. Using an estimated replacement cost of \$50,000 per site total replacement cost is \$5,650,000.

Transportation: Road Maintenance, Decommissioning, and Range of Alternatives

Some commenters were concerned road maintenance would be affected by selecting an action alternative.

“The DEIS states that only under the action alternatives would road drainage problems be repaired. (DEIS at 3-273). This is inaccurate. If the no-action alternative is selected, that will increase the amount of road repair and decommissioning that would occur.”

Forest Service Response:

The DEIS on page 3-273 states, “Alternatives 2 through 5 would include standard maintenance of existing roads and would repair road drainage problems as needed (Barnhart 2012).” This does not conclude that road maintenance would only occur under the action alternatives. This is stating that with Alternatives 2 through 5, a timber sale

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purchaser would be required to maintain any roads used for timber haul. Road maintenance would be paid by the purchaser. Under Alternative 1, no road maintenance would occur associated with the Big Thorne Project. Road maintenance would continue throughout Prince of Wales on the normal cycle based on need and funding.

Transportation: Road Maintenance Funding and Cumulative Effects

Some commenters were requesting clarification on the relationship between road maintenance budgets and Big Thorne Project work.

“The relationship between project funding, and existing road restoration & management funding, is unclear. Please explain how road maintenance budgets work with respect to impacting ongoing maintenance in the EIS.”

“The cumulative effects section of the transportation analysis fails to consider the cumulative effect of the logging-related road infrastructure on the schedule of maintenance in the POW ATM, and in annual Forest Service budgets and work priorities.”

“The methodology is not clear as to how the Forest Service considered the impact of the project on road maintenance. Also, much of the underlying data (e.g. RCS) is suspect. Please correct these two errors in the FEIS, and provide a workable picture of the cumulative and direct impacts related to road maintenance and disrepair.”

Forest Service Response:

Road construction and maintenance in support of the Big Thorne Project are the responsibility of the purchaser. Commercial users of NFS roads are required to perform maintenance commensurate with their use, 36 CFR 212.5 (d). There is currently no ongoing or planned road maintenance supporting the Big Thorne Project.

Annual road maintenance is funded separately from road maintenance associated with timber sales. The maintenance and reconditioning of NFS roads is done through separate service contracts. The timing of this work may coincide with this project’s analysis but is not part of the proposed action or alternatives being considered.

The DEIS on page 3-427 includes a discussion of road maintenance and road maintenance budgets. Road maintenance cost by alternative for roads to remain open and a discussion of impacts are in the Transportation Resource Report and additional information has been added to the Transportation section of the FEIS.

Individual maintenance plans are established for each timber sale prior to award and are enforced through the life of the contract. It is the responsibility of the purchaser to pay for the road maintenance commensurate with their use.

Watershed Improvement Tracking road surveys and engineer road surveys were conducted for the FEIS to document maintenance and road storage needs on existing roads in the project area. These road surveys provided information on the potential sediment sources for watershed analysis and also provided needed information to

complete service contracts for potential timber sales that result from this project.

Transportation: Road Monitoring Requirements – Project-Related

Some commenters were concerned with monitoring requirements.

“Especially given the importance of monitoring to mitigation of project impacts, additional assurance of monitoring should be provided. Please discuss both the specific monitoring to be done, as well as the availability of funding to carry it out. For example, how will proposed ML1 roads be monitored, particularly given that ML1 roads are not allotted maintenance funding?”

Forest Service Response:

Routine implementation monitoring is part of the administration of any contract as described in the DEIS on page 2-12. Forest Service road inspectors ensure that the contract requirements are met through routine inspections.

Maintenance Level 1 (ML1) roads by definition are in a self-maintaining status and planned deterioration may occur at this maintenance level. Emphasis is given to maintaining drainage facilities and runoff pattern and periodic monitoring is performed when these roads are needed for use.

Additionally, BMP monitoring conducted annually includes a random sample of road projects, including road storage and ML-1 roads that have not been physically stored.

Transportation: Road Storage Categories, Level of Storage

Some commenters were concerned with road storage implementation and road storage costs

“First, the categories are legally suspect. We question whether the Forest Service new subdivision of road maintenance/ storage and decommissioning is consistent with national forest transportation planning regulations, the TLMP, or the APA. These categories do are not consistent with the options presented in national transportation regulations (CITE 36 CFR 212).”

“Second, as a policy matter the categories are unwise. Systems are not in place to track and monitor this subdivision of stored roads. These categories appear to have been recently invented, so presumably could change without notice.”

“Please scrap this road maintenance designation. If you do go forward with it, please consider this road status in greater detail in the FEIS. Basically, this category amounts to walking away from a road, a head-in-the-sand strategy that has proved unwise in the past.”

“If the Forest Service knows of scientific authority showing that drainage structures left in place on ML1 roads are a good idea, then we would like to see it. Please also consider the financial implication of placing roads in ML1 status, in terms of availability of appropriated road maintenance money .”

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“First, please remove even the functional cross-drains and Class IV drainage structures. Hydrology is dynamic. A ditch or culvert that is functioning today, may not be functioning tomorrow.”

“Road storage costs are estimated in the DEIS at about \$4,000 per mile, and for temporary roads \$3,000/mile. Total project storage/ decommissioning costs run from \$111,000 to \$330,000. In the POW ATM EA, road storage/ decommissioning costs were much higher (\$9,000 - \$12,000/ mile). Other documents in the project file indicate different values for road storage costs. The additional cost for NFS versus temporary road is substantial: \$65,000 per mile higher, with additional storage/decommissioning cost of \$1,000 per mile. Barnhart 2012 at p.B-2.

Please sort out these numbers, and provide a rational estimate of project road costs, in the EIS.”

“Storage Category A violates BMP Road-6, in that basic custodial maintenance would not be done. Leaving a road for 5-7 years without any inspection is irresponsible, especially if designated as a motorized trail, but also on technically “closed” roads that remain passable.”

Forest Service Response:

Road storage is defined as the process/action of closing a road to vehicle traffic and placing it in a condition that requires minimum maintenance to protect the environment and preserve the facility for future use (FSH 5409.17 chapter 60).

The road storage categories (A, B, C) describe the level of storage during the storage cycle. The storage categories provide recommendations that attempt to balance future access needs with resource risks. For example, a road with high resource risk that is not needed for many years would be a C road and would likely need site-specific work items for storage. In contrast, a road with very low resource risk that is needed in 3 years would be an A road and would require little work to store. In practice, there are many combinations of risk and access needs; field evaluation is necessary to determine the appropriate work items used to physically store roads and meet BMPs for protecting water quality and fisheries. Regardless of the storage category, motorized vehicles are prohibited.

Tongass Land and Resource Management Plan at TRAN6-6 (p. 4-86), directs to “Place roads identified through environmental analysis as needed on an intermittent basis into storage (Maintenance Level I) to be in a self-maintaining status (Maintenance Level I), as funding permits.”

Some roads may be allowed to disinvest to allow uncompensated deterioration of assets gradually over time. For example, a road may need to be operated and maintained at a higher level during periods of commercial use than is required at other times.

Other situations may require that a road be stabilized to preserve the road structure and/or to reduce erosion and then stored (Maintenance Level 1) between use cycles. Some maintenance work activities may be deferred while the road is in a planned disinvestment or a stored cycle (FSH 5409.17 Chapter 60).

Additional information has been added to the Road Card Introduction to the FEIS to clarify the methods used to store roads. A list of the highest priority roads for closure is in the project record. Typically, hydrologists and fisheries biologists have prioritized roads based on resource risk and conducted the field evaluations to develop storage contracts with engineers. Each road and crossing structure is evaluated to determine the appropriate storage strategy to meet BMPs. In accordance with the BMPs, drainage structures may be retained in low risk, stable situations where fish passage is not impaired. Retained structures are treated to reduce risk of diversion by removing fill material over the culvert. This minimizes the effects of potential failures while minimizing the costs of re-opening the road when it is needed again.

Cost estimates for road storage are based on recent bid values from contracts. Prices vary based on work items, economy of scale and location. The estimated cost of \$4,000 per mile for storage work is an accurate representation of road storage. For recent road storage contracts on Prince of Wales Island, the cost per mile was \$3,900 and \$4,000.

Your desire to remove cross drains and Class IV drainage structures is noted.

Basic custodial maintenance will be completed on any road being placed in storage. Basic custodial maintenance includes the work items necessary to put a road into storage. Basic custodial maintenance focuses on maintaining drainage facilities and runoff patterns to avoid or minimize damage to adjacent resources and to perpetuate the road for future use. The integrity of the roadway is retained to the extent practicable and measures are implemented to reduce sediment delivery, from the road surface and fills, and reduce the risk of crossing failure and stream diversion.

Transportation: Road Storage Self-maintaining Road, Monitoring

Some commenters were concerned with “self-maintaining” roads.

“What is a self-maintaining hydrologic status? We are concerned that this rhetorical designation gives the misleading impression that these roads will not impose administrative costs on the Forest Service. This is inaccurate, as there really is no such thing as a self-maintaining road. All roads must be monitored, at minimum, biannually.”

Forest Service Response:

The Forest Plan directs to place roads identified through environmental analysis as needed on an intermittent basis into storage (Maintenance Level I) to be in a “self-maintaining status” (Maintenance Level I), as funding permits, Road Maintenance: TRAN6, I, A6.

A self-maintaining road will be implemented using the following criteria (National BMP Road-6):

Use suitable measures to reduce the risk of flow diversion onto the road surface.

- Consider leaving existing crossings in low-risk situations where the culvert is not undersized, does not present an undesired passage barrier to aquatic organisms, and is relatively stable.
- Remove culverts; fill material, and other structures that present an unacceptable

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risk of failure or diversion.

- Reshape the channel and streambanks at the crossing-site to pass expected flows without scouring or ponding, minimize potential for undercutting or slumping of streambanks, and maintain continuation of channel dimensions and longitudinal profile through the crossing site.
- Use suitable measures to avoid or minimize scour and downcutting.
- Use suitable measures to ensure that the road surface drainage system will intercept, collect, and remove water from the road surface and surrounding slopes in a manner that reduces concentrated flow in ditches, culverts, and over fill slopes and road surfaces without frequent maintenance.
- Use suitable measures to stabilize unstable road segments, seeps, slumps, or cut or fill slopes where evidence of potential failure exists.

See previous response regarding Road storage categories, level of storage, for further information.

Transportation: Road Storage and Stream Crossing Structures

Some commenters noted an error regarding stream crossing structures on the road cards.

“Lots of the stream crossing cards indicate that fish stream crossings will be evaluated for closure after the sale “(?)” However the RMOs suggest the roads will remain in storage. Please explain what this notation means. We advocate removing all stream crossing structures on fish streams, unless there is a pressing site-specific reason why the existing structure is better for habitat.”

Forest Service Response:

The use of the “?” is a typographical error and has been fixed. Each structure will be evaluated to determine the appropriate storage strategy. The FEIS has been clarified to state that all culverts on fish streams that do not meet passage standards (red culverts) will be removed during road storage. Roads that may be needed in the near future may have some structures left in place to reduce the cost to open the road in the future. See response regarding Road storage categories, levels of storage.

Transportation: Inadequate Road Survey Data

Commenters were concerned the available road data was not up to date.

“The first problem is that road condition surveys are old. The DEIS says they were primarily completed from 1998 to 2002, after which a number of roads were prioritized for treatment in the Central Thorne and Gravelly Creek subwatersheds. It is unclear if this was done. Our own review of the RCS spreadsheet, admittedly incomplete, found that there are a large number of older entries, and fewer entries for more recent years. Surveys that are over a decade old are clearly out-of-date if that is the most recent information. Even closed roads should be surveyed more frequently than that, under a host of Forest Service and regulatory BMPs. The

DEIS gives no explanation for why the surveys are so old, or what the cost would be to bring them up to date.”

“The second problem is that the surveys are incomplete. Many entries have many portions blank. An issue is briefly revealed on the road cards to the effect that the GIS data does not match the RCS data. This is a large and potentially very serious error.”

“The conclusion that RCS information is adequate is nothing but a blanket assertion, and furthermore it sets the bar too low. It is true that existing RCS data is useful, and that enables some useful comparisons and conclusions....

Our review found large differences in the numbers of stream crossings between mapped (GIS) and narrative (RCS) data for the same road sections.”

“The EIS disclosures leave unanswered the important questions of how much road is unsurveyed, why it is not, and whether this information should be gathered first. Discussion of such data gaps is an important part of NEPA. The mapping and RCS discrepancies give rise to major questions about all the modeling results which hinge on the number stream crossings. If the number of road-stream crossings being considered is wrong then we need to know it. The EIS just barely discloses data gaps (in the road cards) and proceeds on the assumption that they don’t matter.”

“Given these deficiencies, the first question becomes whether better road survey information should be gathered now, later, or not at all. That question must be answered with reference to a hard look at the environmental consequences, per NEPA. We urge that all roads that would be utilized for the proposed action, be surveyed prior to the EIS.”

“Please incorporate the best available on-the-ground information regarding road condition in the FEIS. Whatever road surveys are done, even if they are incomplete or inadequate, please discuss and include them in the EIS. This information should be on-hand for resource experts at least, and should be discussed in the EIS where results are relevant.”

“Setting aside the NEPA issues, the poor quality of RCS data is also problematic in terms of compliance with substantive requirements of the TLMP, and various applicable BMPs. When unmonitored, roads can cause large, prolonged effects before they are resolved. Lack of monitoring is destructive, to the same degree that mitigation and maintenance are effective.”

“Inspections and monitoring are a critical part of maintenance that have been hit hard by the maintenance backlog. The project record makes it difficult to discern, but there are evidently many roads and culverts which have not been inspected in many many years.”

“The best existing road condition information available should be put forward in the FEIS, to enable the reader (and decision-maker) to gain a picture of the potential cumulative impact on watersheds.”

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Forest Service Response:

Portions of the road condition surveys (RCS) have been updated annually through 2012 with emphasis given to road-stream crossing sites. The updated records have been added to the project record. Additionally, project roads have been surveyed to determine work required to recondition or perform additional storage. These road surveys have been included in the project record.

The FEIS has been edited to include more information on completed and ongoing road maintenance in the project area.

Commenter notes a discrepancy between RCS stream locations and GIS mapped stream locations. RCS data is measured linearly along the roadway using a variety of methods including hip chains, digital measuring tools, digital measuring instruments on vehicles, etc. This RCS data is projected into GIS using linear referencing tools. GIS stream locations are GPS locations or digitized locations. The two methods may not always achieve the same spatial location.

Transportation: Storage Methods, Irretrievable Commitment

Commenters felt the road storage plan was an irretrievable commitment of resources.

“The financial and environmental effects of these repeated re-entries is an irretrievable commitment of resources, that must be considered and balanced in the EIS.”

Forest Service Response:

Road storage is not an irretrievable commitment of resources. An irretrievable commitment refers to the lost production or use of a resource that would cause the resource to be unavailable for use by future generations. Examples include the permanent extraction or alteration of nonrenewable resources, such as minerals and cultural resources, and changes to renewable resources that would then become unavailable for use by future generations.

Transportation: Temporary Roads as Temporary Fills

Commenters felt temporary roads should be addressed as temporary fills.

“(xv) All All temporary fills shall be removed in their entirety and the area restored to its original elevation. Temporary fills tend not to be removed, as evidenced by the large number of abandoned roads in the project area. Fill for “temporary” roads is in reality dumped on top of wetlands, in many cases forever changing them into uplands.”

Forest Service Response:

The temporary roads proposed for the Big Thorne Project meet the silvicultural exemption from the 404 permitting process. The baseline provisions and BMPs applicable to the temporary roads are listed on the unit cards. Temporary roads are only considered temporary in terms of use; they are not considered temporary fills. The EIS effects analysis assumes they are permanent fills and discloses their effects accordingly.

The Corps of Engineers (COE) is responsible for oversight of the 404 permit program and the silvicultural exemption. The COE did not provide comments on the Draft EIS for this project. In comments provided to the Kosciusko Timber Sale DEIS (August 26, 2002), Couverden Timber Sale DEIS, and the Boundary Timber Sale EA (September 10, 2004), the COE has directly addressed the commenter's concern. According to these letters from the COE, road storage or road decommissioning (where access is blocked and stream crossing structures removed) is an acceptable implementation of baseline Provision 15 on temporary roads.

Transportation: Temporary Roads with Drainage Structures

Some commenters were concerned that drainage structures are still in place on some closed roads.

“The POW ATM EA reported that some past “temporary” roads still had drainage structures in place and were damaging the environment. Please consider and disclose whether any such roads exist in the project area.”

Forest Service Response:

According to RCS data, located in the project record, there are 35 drainage structures still in place on decommissioned roads. All were still functioning and four show some level of failure.

Transportation: Transportation Analysis Incomplete

Some commenters were concerned the transportation analysis was incomplete and required additional analysis.

“Second, the quality of the Forest Service roads analysis should improve prior to making a decision on this project. The TAP did do a road-specific risk/benefit rating for each road. We are concerned that the TAP process did not fulfill its mandate for analyzing roads to determine which should be closed or decommissioned.”

“Fourth, the TAP analysis was not based on a full consideration of environmental factors.”

Forest Service Response:

The Travel Analysis has been updated. The risk/benefit analysis has been broadened. The Transportation Resource Report, Appendix B (page B-15) contains the risk/benefit rating and a determination on travel management. The proposed objective maintenance level (OBML) along with the travel management shows the planned disposition of each NFS road.

Transportation: Transportation Range of Alternatives

Some commenters were concerned the range of alternatives was overly narrow in analyzing the transportation system.

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“Please include a discussion of a realistic comparison of alternatives in terms of road maintenance, storage strategy, and location. Consideration of alternatives is supposed to be the “heart” of the EIS, but when it comes to transportation management the EIS only really presents a single alternative. It is impossible to know the impact of the strategy proposed, or whether it identifies all appropriate mitigation, if there is nothing to compare it to.”

Forest Service Response:

The alternatives for the transportation analysis are in response to the purpose and need and the range of alternatives. Each alternative requires a different transportation system in response to the alternative design criteria. The POW ATM EA considered alternatives for road maintenance levels for existing roads. Also see response to NEPA: Range of Alternatives.

Wetlands: General Comments

A commenter believes that the project impacts on wetlands are large and unacceptable. Another would like to see them analyzed on a watershed scale and described as watershed and fishery impacts.

“The DEIS acknowledges the limited literature regarding the effects of logging on forested wetland functions. DEIS at 3-358. Based on this scanty research, the conclusion is that the project “would not pose a long-term negative impact to wetlands” in the area. DEIS at 3-358. This conclusion strikes us as unjustified, given the scanty research.”

“The DEIS states that “implementation of adequate road drainage minimizes the impacts to hydrologic connectivity of wetlands,” which gives the misleading impression that road drainage BMPs are currently (and are likely to be in the future) adequately implemented, and that BMPs can magically minimize impacts.”

“In the Final EIS, please analyze wetland impacts on a watershed scale, as well as the project area scale. Please also encompass those findings (e.g. percent of wetland converted to road) into analysis of watershed and fishery impacts.”

Forest Service Response:

The Wetland section in FEIS describes the anticipated effects to wetlands based on the best available science. The literature cited in the FEIS is from Tongass and similar British Columbia wetlands and constitutes the best available science. The FEIS makes it clear that impacts to wetland hydrology from timber harvest on forested wetland is a temporary effect and the wetland remains a wetland. The young-stand will have different structural attributes than the stand it replaces, but the effects of harvest are known and similar to upland stands. The effects of timber harvest on wildlife habitat is accounted for in the wildlife section. Additional research into the effects of logging on forested wetland functions is not necessary for the decision maker to make a reasoned decision.

The DEIS suggests that harvesting timber from forested wetland results in a temporary hydrologic effect. Harvesting timber alone is not expected to convert a forested wetland to upland. Forest roads constructed across wetlands do alter wetland hydrology for the

foreseeable future and convert a portion of the wetland to upland. Roads impact a much smaller portion of the project areas wetlands (cumulatively 2.5 percent to 2.6 percent depending on alternative see Table WET-3 in the DEIS) than timber harvest.

The Forest Service has conducted monitoring of roads crossing wetlands in recent years. The findings conclude that the 15 Federal baseline provisions requiring wetland avoidance and impact minimization are being implemented and impacts are minimized. The findings of this monitoring will be discussed in the Wetlands section of the FEIS.

Wetland impacts are described on a project level for the Big Thorne EIS and not by watershed. See response to Hydrology: Peak and Low Flows. Percent impacts by alternative can be found on Table WET-3 in the Wetlands section of the FEIS.

Wetlands: Survey Data Quality

One commenter had questions about the quality of the wetland data.

“What is the quality of the survey data on which forested wetland analysis was conducted? The DEIS states the mapping layer is field verified in about 85% of units, and that the young growth units have not been field verified.

What is the quality of the wetland survey data with regard to existing and proposed roads? In particular, abandoned/stored/closed/decommissioned roads should be field evaluated for wetlands, as this may not have been done at the time roads were put in.”

Forest Service Response:

Wetland field survey data can be found in the project record. Approximately 85 percent of the old-growth harvest units in the unit pool were field visited. Not all wetlands have been field surveyed. Office surveys and reviews of existing roads include the use of aerial photos, wetland maps, and contour maps. Whether field surveyed or not, all wetlands impacted by existing management actions or potentially impacted by proposed activities are considered and effects included in the cumulative effects section. Some of the existing roads on the Big Thorne Project Area were constructed prior to the CWA or were analyzed in other NEPA.

Wetlands: Wetland Avoidance

One commenter was concerned that the Forest Service was not taking required measures in wetland avoidance and wanted the methodology.

“Please carefully consider this issue prior to the FEIS and project decision, and document the process that was used in the EIS.”

“We are concerned that the required wetland avoidance measures have not been taken. It is simply asserted that wetlands were avoided where practicable. But the project record does not reflect any systematic effort to avoid wetlands.”

“Please clarify in the Final EIS the methodology the inter-disciplinary team used to avoid location of roads and logging units over wetlands, and seek to avoid wetlands. We are particularly concerned that roads on slope wetlands be avoided,

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as BMP effectiveness is low here. It is simply not possible to maintain natural hydrologic flows with a road across sloped wetlands. Specific failures of mitigating BMPs have a magnified impact in these areas.”

Forest Service Response:

Avoiding wetlands is a priority during road location. Applying BMP 14.2 ensures minimizing road locations on wetlands. The key objective to BMP 14.2 is to ensure soil and water resources protection measures are considered when locating roads and trails.

- a) Location activities will utilize the interdisciplinary process to evaluate effects of transportation development and operations, and recommend measures to minimize adverse impacts.
- b) Where practicable, avoid locating roads, trails, and access to LTFs within riparian areas, wetlands, floodplains, alluvial fans and outwash areas. Other high-risk considerations in access are large V-notch ravines, and slopes with a high V-notch frequency, landslide prone and snow avalanche zones, and soils with low strength. Generally, ash and glacial fluvial deposits have low strength.
- c) Where practicable, roads should cross wetlands, floodplains, and alluvial outwash areas in the narrowest, most stable locations. In most instances braided channel areas should be avoided. Locate crossings perpendicular to the stream channel where appropriate, considering user safety.
- d) Where practicable, avoid locating road intersections in wetlands (see BMP 12.5).

Typically roads are located by a transportation engineer. Other IDT members including soil scientist/wetland specialists, botanists, and aquatic specialists review road locations, either in the field during reconnaissance for the project or in an office setting associated with an IDT meeting. Avoidance of wetlands, steep slopes, rare plants, or other aquatic resources are discussed at that time. Road locations may be revised or dropped depending on concerns and opportunities for alternate locations.

Wetlands were avoided to the extent practicable (see FEIS Chapter 3 Wetlands section, unit cards, and road cards). The best possible road location is the one shown on the road cards.

Some forested wetlands are scheduled for harvest in conjunction with the rest of the proposed timber harvest. Access to forested wetlands for vegetation treatments is often best accomplished with a road. Proposed road locations avoided wetlands to the extent practicable. Details of wetlands avoidance can be found in the Wetland section of the FEIS and the road and unit cards. Various routes were considered throughout the project but were not chosen due to numerous reasons, including wetland impact. Helicopter yarding instead of building road was considered in the minimal roads alternative (Alternative 5) and on a case-by-case basis.

Road construction on sloping wetlands can have greater hydrologic effects than on flat wetlands; however, Forest Plan monitoring data and the literature cited in the in the FEIS indicates that the hydrologic effects are generally limited to within a few meters of the road, and current road construction practices minimizes the hydrologic impacts, BMPs that require cross drains at preferential flow paths, combined with the use of coarse,

permeable shot rock fill limit water diversion on sloped wetlands.

Wildlife: Black Bears

Commenters have expressed concerns about the effects of the proposed project on black bears and their habitat; and the effects of increased road densities.

“First, the DEIS failed to look at high-value bear habitat low-elevation, old-growth forest with abundant and productive salmon streams.”

“Second, the DEIS did not provide discussion about black bear utilization of and the project’s impacts to large tree old growth.”

“The DEIS analysis fails to comprehensively evaluate long term impacts to black bear that would occur under the planned alternatives or to evaluate the impacts on forage availability due to impending canopy closures in past and future clearcuts.”

“Please also review the implications of the 1986 Lindzey and Meslow study on black bear responses to changing environments {Exh-64}.”

“The DEIS failed to review the most recent ADFG black bear management reports to seek out information on current harvest trends in the project area or to consider illegal take of black bears. The DEIS failed to consult with ADFG biologists who have experience on POW involving black bears.”

“The DEIS did not include evaluation of recent studies on the importance of riparian buffers to bear populations {Exh -51}. The DEIS failed to evaluate expanding riparian bear buffers as a mitigation measure.”

“In the supplemental EIS we request clarification of whether class I streams will have only the minimum 100 foot buffers or whether black bear foraging areas will receive additional protection pursuant to 2008 TLMP guidance and the recommendations of regional bear experts. We strongly encourage the implementation of 500 foot buffers if the project goes forward and consideration of these buffers in the supplemental EIS.”

“Additionally, the DEIS noted that ADFG expects a reduction in deer carrying capacity over the next decade (Baichtal 2012) which would negatively affect not only deer, but bears.”

“Area residents have submitted proposals to the Alaska Board of Game asking for more protection for black bears in order to foster wildlife tourism. Further loss of habitat is a concern for both consumptive and non-consumptive user groups and presents a potential loss of income to the affected communities.”

Forest Service Response:

While the DEIS may not analyze low-elevation productive old growth near salmon streams specifically, it does disclose changes to large-tree POG by both VCU and biogeographic province in the Biodiversity section. Changes to both the low-elevation POG and large-tree POG are discussed Issue 2: Old-growth Habitat LUD and Issue 3: Wildlife and Subsistence Use. The effects to the low-elevation POG, within the OGR

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boundaries are discussed in Issue 2. The effects to low-elevation POG by WAA are discussed in the Deer and Marten sections of the DEIS in the analysis of the deep-snow habitat (POG below 800 feet) for these species. The areas of large-tree old-growth forest along all salmon streams are bordered by the mandatory TTRA 100-foot buffer and also have a Riparian Management Area (RMA) and a Reasonable Assurance of Windfirmness (RAW) buffer as required by the Forest Plan. See Fisheries section for more information. These stream buffer widths are all included on the unit cards. Large-tree, productive old growth within 1,000 feet of the shoreline (beach fringe) is also protected by Forest Plan Standards and Guidelines. The DEIS did not look at the effects to bears over the long term due to foraging areas entering the stem exclusion stage when the understory becomes scarce or absent. However, the analysis on the effects to deer habitat at stem exclusion (Table WLD-18 and 20 and pp. 166-171) is included in the document. The changes from foraging habitat to stem exclusion for bear would be similar to that of deer in that as the acres become unavailable to deer for forage, they are likely unavailable to bears as well. While the effects to bear would not be expected to be the same as those to deer, it can be inferred that they would be similar; that is, bears are more likely to avoid these areas at stem exclusion.

According to Lindzey and Meslow (1986), this reduction in foraging habitat will likely result in a decrease in the bear population. Lindzey and Meslow determined that the changes observed on Long Island (in Washington State) showed that reductions in bear population were caused by the change in vegetation from the succession of clearcuts to older seral stands. Rogers (1976) found a similar relationship between food abundance and reproductive success in black bears in Minnesota.

In response to the fact that the DEIS failed to consider illegal take, the DEIS discusses road densities, and the change in road density by alternative, in the both the Wolf and Marten sections. Although there is no road density threshold specified for black bears, it can be assumed that an increase in open roads, particularly in open habitats such as clearcuts, muskegs, and alpine areas, where bears forage and are easier to see, increases the potential for human-bear interactions. The proposed timber harvest project may also indirectly increase the susceptibility of black bears to over-harvest if road access is increased or improved. The amount of proposed road construction is discussed under the Transportation section.

The 2011 ADFG harvest report on bears, the most recent available, is cited in the DEIS. Information about increased road densities and the potential for increase in illegal take has been added to the FEIS. ADFG and the Forest Service consulted about the potential impact of proposed units on black bear den sites, which included information from a Forest Service employee working on a study of bear den sites with ADFG. While the Forest Plan does not require buffers for black bear dens, a 300-foot buffer was applied to all known black bear den sites within the project area for the Big Thorne Project. Since there is no recognized buffer size, and data related to black bear den selection, use, and vulnerability is lacking, the buffer distance for bear dens was determined by consultation with the State of Alaska. The Forest Service consulted with Kyle Moselle, State of Alaska, OPMP, who then consulted with ADFG wildlife biologists, Neil Barten and Rod Flynn, on what size buffers would be adequate to avoid disturbing black bear dens during forestry activities. They supported the idea of discussing different buffer sizes with the ID

team and then recommending they apply either the Legacy Forest Structure or the Reserve Tree/Cavity-Nesting Habitat Standard and Guidelines in areas overlapping the proposed timber harvest units.

During the planning team meeting on April 27-28, 2011, buffer size was discussed between with Marla Dillman, USFS wildlife biologist and Brita Woeck, Tetra Tech wildlife biologist and Kyle Moselle. Boyd Porter, ADFG wildlife biologist, was contacted to seek his input on reasonable buffer sizes. A buffer size of 300 feet, which is the size of riparian management zones on state forest lands pursuant to the Alaska Forest Resources Practices Act (AFRPA) was determined to be adequate and applied to the beer dens for Alternative 4, which emphasizes protection of wildlife habitat. The 300-foot riparian management zones on state forest lands are sized, in part, to provide wildlife habitat values.

The study by Flynn (2007) on the importance of riparian buffers was not discussed since it is specific to brown bears, not black bears, and there are no brown bears on Prince of Wales Island. The Forest Plan Standard and Guideline for 500-foot stream buffers is also specific to important foraging sites identified by ADFG for brown bears (Forest Plan, p. 4-92.)

Black bears are omnivorous but preferred food varies by season. During summer and fall, the accumulation of fat reserves for winter hibernation is important. Berry crops are an important food source during this period, and bears that have access to salmon streams will eat large quantities of fish. Early successional habitat (e.g., young clearcuts) can provide abundant food source of berries; the acres of harvest for each alternative are disclosed in the DEIS. These acres may benefit black bears in the short term. The salmon streams utilized by bears in summer and fall are protected by Forest Plan Standards and Guidelines. Having fewer fawns available as a food source in the spring may have an effect on bears; however, due to both the wide variety of foods consumed by bears and the short-term availability of fawns as a food source, the magnitude of effect to the black bear population is unknown.

Several of the ADFG management objectives for black bear have not been met in GMU 2 since 1998, raising some concern for conservation of black bears in this unit. The age trend in harvested male bears appears to be stable, but the age class of harvested females is increasing and the male skull size is decreasing. ADFG concludes this may be due to hunters harvesting older female bears instead of a male, because the older females are the largest animal they encountered (Bethune 2011). The ADFG management objective for the male skull size during the spring harvest is 19". Review of records back to 1987 indicates the spring of 2001 was first time since then that the skull size objective was met. Between the spring of 2002 and 2010, the objective was not met 4 out of 8 years, with 3 of these years being 2008, 2009, and 2010 (Bethune 2011). More recent records than 2010 are not available.

The sex ratio of the harvest in GMU 2 is also of concern to ADFG. This objective that 75 percent of the harvest be male bears was met 3 out of the 10 years between 2000-2009, ranging from 69 to 77 percent, and averaged 73 percent. This management objective has not been met since the 2003 regulatory year and has ranged from 69 to 74 percent. This is in contrast to the previous 10 years (1990-1999) during which the objective was met more

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often (7 out of 10 years) and the average was slightly higher (75 percent; Bethune 2011).

Therefore, based on available literature, data collected, and crude density estimates, ADFG believes the black bear harvest in GMU 2 the past several seasons has exceeded sustainable levels (Bethune 2011). Bunnell and Tait (1985) estimated the maximum allowable annual hunting mortality on black bears over 1 year old is 14.2 percent of the estimated population. Based on Larsen's (1995) population estimate in 1995 of 5,400 black bears, the maximum sustained yield in GMU 2 would be 767 bears. Annual harvest has been below this level at least since 1988 which has been 211 to 486 bears. Because ADFG believes the recent harvest has not been sustainable and the bear population has been reduced markedly the last several years, the 14.2 percent sustainable harvest rate may be too high or ADFG may have over-estimated the bear density and population (Bethune 2011). Other factors to consider are wounding loss, kills associated with defense of life and property, and illegal kills. Wounding loss may account for 50 percent more mortality on top of the annual harvest on POW. In addition, the actual number of bears killed in defense of life and property on POW may be much higher than is the reported number of 1 to 2 bears each year (ADFG report, 2011).

GMU 2 WAAs receiving the highest hunting pressure are 1318 (Craig and Klawock area) and 1422 (Tuxekan and El Capitan passages), which offer easy road access and accounted for 21 percent of the harvest from 1991 to 2003. WAAs 1420 (Ratz Harbor to Coffman Cove), 1317 (south and west of Hollis), and 1530 (Whale Pass and Exchange Cove) have more recently received notable hunting pressure. Protected bays in these areas also offer good access via the saltwater.

ADFG reports that regulatory changes such as implementation of the Southern Southeast Islands Controlled Use Area and a draw hunt for non-guided non-residents are intended to address concerns for the sustainability of past harvest rates (Bethune 2011). ADFG will also continue to track harvest in specific locations where they make up a large proportion of the total bear harvest to use to adjust future population estimates.

In addition, ADFG and the Tongass National Forest are collaborating on several studies to better understand the nature of black bear densities on POW and the effects of harvest and habitat management. This includes a mark-recapture study initiated in 2008 using hair from live bears (Beier et. al. 2005) for genetic identification using hair (mark) and genetic samples from harvested bears (recapture). Hair snares for collecting bear hair were set the summer of 2008, 2009, and 2010. Tissue from sealed bears was collected during this same period, but unfortunately a large portion of the samples were lost or compromised. ADFG is currently waiting for the DNA analysis results from the lab for the existing samples and will then complete their mark-recapture analysis to determine the harvest rate as well as a rough estimate of bear density.

A second study began in 2009 to determine demographics, life history, and movement patterns of bears and their vulnerability to harvest. ADFG has fitted 21 bears with GPS and VHF collars to track their movements. Body measurements of captured bears are taken, as are blood and tissue samples. Home range size and birth and survival rates will be estimated and den sites and habitat selection will be described.

Wildlife: Cavity Nesters and Marbled Murrelets

Commenters have expressed concerns about the how the effects of the cavity nesters and their habitat; and the effects of increased road densities.

“Our scoping comments requested that you analyze project impacts on cavity nesters because their association with old-growth habitat makes them an indicator of forest health and could foreshadow declines in other avian species. The DEIS should do more than just catalogue productive old-growth habitat loss and should not simply defer to protections provided by OGRs, non-development LUDs, cavity nester and Legacy Forest Structure standards and guidelines provide adequate protection. What are the specific sensitivities to fragmentation and edge effect? What are the historical population levels, and has there been a decline since 1954?”

“With regard to marbled murrelet, the DEIS measures impacts based on total POG removals rather than specific habitat needs and lumps marbled murrelets in with cavity nesters. Please specifically disclose risks to marbled murrelets associated with increased forest fragmentation and edge effect, including nest predation. Are some of these effects irreversible? Also, in the past, the TNF used to survey for marbled murrelets. Why was that not done for this project?”

Forest Service Response:

The habitat requirements of the brown creeper and the primary cavity excavators, the hairy woodpecker and red-breasted sapsucker, are discussed in the Issue 3, Wildlife and Subsistence Use as MIS and the marbled murrelet as a species of concern. The Biodiversity section under this issue displays the effects of proposed timber harvest on the reduction of productive old-growth (POG), high-volume POG and large-tree POG and relates them to the habitat requirements of these species. The historic populations of these species are not known, but there may have been a reduction in populations since 1954 that relates to the removal of old-growth forests. The effects to interior POG habitat used by these species have been added to the FEIS. Information on population trends in Alaska has been added to the Wildlife Resource Report.

Although the marbled murrelet was not specifically addressed in the analysis, the habitat for this species was addressed with the analysis of the reduction of old-growth habitat. Murrelets nest near shore waters and prefer large-tree POG since the larger limbs provide nest sites. The Forest Service in Southeast Alaska no longer requires surveys for nests since they were found to be unproductive, and very few nests are found. The boat surveys and pre-dawn surveys that were done in the past resulted in detecting many adults, but were inconclusive as to where the birds were nesting. Crews conducting other surveys also look for signs of murrelet nesting, such as eggshells, and any observations were documented.

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Wildlife: Effects of Conservation Strategy and Climate Change

Commenters had concerns about climate change was addressed in relationship to the conservation strategy.

“First, we note that the DEIS is in error in saying, “Ultimately, the Forest Plan Conservation Strategy is intended to maintain the persistence the old-growth ecosystem (and predator-prey dynamic of wolves and deer which it supports) under the unpredictable effects of climate (USDA Forest Service 2008b).” The Strategy does no such thing, and for example relies on deer modeling that considers only average winters”.

Forest Service Response:

The Forest Plan Amendment FEIS Appendix H, p. H-138 states the following, “We agree that a system of OGRs, various buffer requirements, and non-development LUDs are a means for maintaining a level of biodiversity capable of adapting to the effects of changing environmental conditions.” and “Catastrophic events at a landscape scale would be difficult to predict and nearly impossible to plan for across the landscape. Similarly, predicting climate change effects to Southeast Alaska forests is problematic. The relatively large and comprehensive conservation strategy is expected to be resilient enough to accommodate such uncertainty” (Forest Plan FEIS p. H-147). “In addition to the approach and direction of management on the Tongass, there is uncertainty with regards to the cumulative effects on biodiversity associated with climate change. Noss 2001 has noted though that the most effective means for managing for climate change impacts is through the development of ecosystem resistance which can be accomplished by maintaining a reserve system where active management is minimized.” Thus the Forest Plan, with the reserve system through the conservation strategy, represents a valid method to maintain a resilient ecosystem in the face of uncertain, future change. The effects of adjusting some Old-growth Reserve boundaries are assessed in the Big Thorne DEIS and also in an interagency review of those locations (Interagency Old Growth Reserve Review Report, Big Thorne Project, April 2013 [signed May 9, 2013]).

The DEIS does address the direct, indirect, and cumulative effects in relation to the possibility that climate change leads to more severe winters with more snow, more frequently by the analysis to deep-snow deer and marten habitats discussed in Issue 3: Wildlife and Subsistence Use.

Wildlife: Core Wildlife Analysis Areas (WAAs)

Some commenters were concerned about how the core WAAs were chosen and the resulting analysis. One commenter was concerned that the biogeographic province was misrepresented in deer analysis.

“The DEIS noted that within the project area the deer and wolf protection guidelines from the current Forest Plan are not met and therefore the Forest Service has looked at the carrying capacity and the road density guidelines at a larger scale (Chapter 3 pg. 93). It was done by selecting individual WAA’s inside and outside of the project area and then combining them into a Core WAA (CWAA) to analyze the direct and indirect effects on wolf and deer. The

assumption being, that deer and wolf can survive by migrating to areas outside the project area. But the combining of selected individual WAA's into a CWAA does not justify the premise that there is an adequate carrying capacity to maintain sufficient populations of deer and wolf under the Forest Plan's standards and guidelines."

"The "core WAAs" concept is an invention of this planning process. In our large library of planning and science documents about the Tongass we find no mention of it. It appears to us to be plain gerrymandering, the cherry-picking of a selection of 10 WAAs that have fairly high carrying capacity scores, in order to come up with an average carrying capacity number that will give the project a passing grade under the Forest Plan's wolf standard and guideline. Doing this is necessary to push the project, if it is to move ahead, because of the low carrying capacity scores for WAAs in the project area and for the North-&-Central POW biogeographic province as a hole."

"The DEIS addressed carrying capacity and road density guidelines, however the process of selecting individual WAAs both within and out of the affected area and combining them into a Core WAA is flawed and does not show that there is enough carrying capacity to maintain adequate deer and wolf populations. A more realistic approach must be taken to fully inform the public, particularly because of the predator-prey relationship involved. In fact, the DEIS noted that ADFG expects a reduction in deer carrying capacity over the next decade (Baichtal 2012) which would negatively affect deer and thus wolves."

Forest Service Response:

The core WAA analysis approach was an attempt to analyze the effects at an intermediate scale since the North Central Biogeographic Province is much larger than most biogeographic provinces. Based on the comments of the DEIS on this approach, the discussion of this analysis has been removed from the FEIS.

Wildlife: Deer Habitat Capability

Commenters have expressed concerns on deer below 18 deer per square mile.

"All Alternatives in the Final EIS need to avoid harvest of stands identified as deep snow winter range for deer. The greatest impact to deer habitat capability results from clearcut logging of low-elevation, high-volume stands, especially those with south-facing exposure.

"Additional reductions" of deer habitat, meaning the percentage losses from 2012 until stem exclusion in 2039 as compared to the losses from 1954 to 2012, are shown in Tables WLD-20 and 21. Upon inspection, these additional losses were obviously calculated by subtracting one percentage from the other instead of calculating an actual percentage change...."

"These kinds of facts are not reported in the DEIS, even though the above sources are cited. The DEIS does mention "declines" in the deer population, but avoids the shocking details. The DEIS has avoided full and fair discussion of important facts

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that are raised in the very documents it cites. It has utterly failed to make important disclosures, and it has not taken a “hard look” at the impacts. ”

“Provide table showing cumulative effects on habitat capability and carrying capacity.”

“The DEOS [sic] underestimated that reduction by 50%. Other cells in the two tables also have significant underestimations. All the cells in both tables need to be recalculated. Because of this error the DEIS has greatly under-reported the addition of the project to cumulative impacts to deer, wolves and hunters.”

“In the DEIS, the analysis of direct and indirect impacts to deer (and thereby wolves and hunters) is based on national forest system (NFS) lands only. This is explained in the seventh bullet at DEIS 3-107, and the practice is followed through in Tables WLD-3, 4, 5, 18 and 23 as well as related discussions. Note, however, that the eleventh bullet is incorrect and unrepresentative of how the direct and indirect effect analysis for deer was actually done – entire WAAs were not analyzed for that in the DEIS.”

“i. Percentage change is over-emphasized in the DEIS.

Tables like WLD-20 which show percentage change in habitat capability without showing the values in deer per square mile a misleading because percentage change is not the appropriate metric for judging deer-related impacts. Percentages can serve as a guide, but need to be accompanied by the tangible values that matter.

ii. The absolute reduction of carrying capacity is a misleading metric.

Another misleading metric, which occurs 8 places in the DEIS, is stating the amount of decline in carrying capacity in deer per square mile...

These numbers are deceptively small, which perhaps is why they are used in the analysis. There is no basis for judging the consequences of these numbers. The consequence that matters is whether or not the 18 deer per square mile standard is satisfied, and if not what is the value? Please stop using the misleading metric.

iii. A metric that makes sense for change in carrying capacity.

To accompany a carrying capacity value, a useful metric the Forest Service has not used is the percentage by which the value is above or below the 18 deer per square mile standard and guideline. For example, carrying capacities of 16 and 20 deer per square mile are 11% below and 11% above the standard and guideline respectively. However a caution should accompany any statements of this statistic: even though a carrying capacity of 14 deer per square mile (22% below the standard) is twice as far below the standard than the example above, it can be expected to represent more than twice the impact because of the nonlinearity of the of the ecosystem functions that are being modeled.”

“a. Alternatives 2 through 5 violate the Forest Plan, contrary to what the DEIS says.

The DEIS claims that “[a]ll alternatives are designed to be consistent with the Forest Plan” (DEIS at 2-9); however, this not true. The Forest Plan requires providing, where possible, a winter deer carrying capacity of at least 18 deer per square mile. Under the purposes of the Tongass Conservation Strategy, in WAAs where carrying capacity is already below that level it is inconsistent with the Forest Plan to further reduce that carrying capacity.”

“We note further that the same sentence on 3-174 includes the patently false statement that this is also true ‘within the biogeographic province.’ Other data at the beginning of the same paragraph states that looking at the whole province the current deer carrying capacity is 15 deer per square mile, dropping to 14 at stem exclusion – which is not enough for a sustainable wolf population.”

“It is incumbent on the Forest Service to assess the direct, indirect and cumulative effects of Big Thorne in light of realistic expectation. The DEIS has not done so, and because impacts to deer-related resources and uses is a significant issue for the project.”

“An even more critical failing of the DEIS is that these Conclusion sections are compartmentalized from each other, and there is no overarching section that reaches comprehensive conclusions in view of all the ramifications of the project’s impact on deer. Moreover, several elements of what should be considered in such a larger view of impacts to deer have fallen through the cracks entirely in the DEIS.”

Forest Service Response:

Deer populations and deer habitat are relevant to the sustainability of the wolf population since deer make up a significant portion of the wolf diet in at least some areas of the Tongass (Person et al. 1993) and are one of the most hunted subsistence species in Southeast Alaska. The current deer model is a winter habitat suitability index (HSI) model, which takes into account an area’s average snow depth, elevation, aspect (i.e., direction slopes are facing), and vegetation type. The Tongass deer model is run using a geographic information system (GIS) that systematically checks each polygon within the analysis area and looks up its habitat value for the above four factors, and sums the resulting habitat values.

The Forest Plan p 4-95 says “Provide, where possible, sufficient deer habitat capability to first maintain sustainable wolf populations, and then to consider meeting estimated human deer harvest demands. This is generally considered to equate to the habitat capability to support 18 deer per square mile (using habitat capability model outputs) in biogeographic provinces where deer are the primary prey of wolves. Use the most recent version of the interagency deer habitat capability model and field validation of local deer habitat conditions to assess deer habitat, unless alternate analysis tools are developed. Local knowledge of habitat conditions, spatial location of habitat, and other factors need to be considered by the biologist rather than solely relying upon model outputs.”

The recommendation of 18 deer/square mile for deer density was based on interagency wildlife biologists’ expertise during the analysis of the Forest Plan; ADFG deer pellet transect data, and nutritionally-based estimates of long-term carrying capacity.

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The deer multiplier used for the 1997 Forest Plan was 125 deer/mi². The deer multiplier has been adjusted over the years as our knowledge about deer habitats and deer nutritional requirements and their relationship to deer densities has improved. The multiplier was lowered to 100 deer/mi² in 2000 based on deer pellet group survey information. The 2008 Forest Plan adopted this multiplier, and it continues to be included in the current guidance. With this deer multiplier and the HSI scores as standardized for the Forest Plan (Forest Plan Amendment FEIS, Volume II, Appendix B, page B-31), the result is a theoretical maximum habitat capability of 100 deer/mi². In other words, the areas of the Tongass National Forest with an HSI of 1.0 for winter habitat for deer could be expected to support a sustainable deer density of up to 100 deer/mi². The deer multiplier is multiplied by the HSI score to calculate theoretical deer habitat capability for a given area. Although deer density outputs from the deer model are useful for estimating changes that result from proposed projects, they do not reflect actual known deer numbers. They do represent the functioning of the predator-prey system dynamic (2008 Forest Plan FEIS, p. 3-282).

The analysis for the Big Thorne FEIS showed that both currently and with the selection of any alternative, including the no action alternative, would result in deer habitat capabilities below 18 deer per square mile. The 18 deer per square mile is what is generally considered to necessary to maintain populations of wolves and deer while providing for sustainable harvest by humans and wolves (Person, et al., 1996).

DEIS p 3-163 and 164: The commenter is incorrect is stating that the DEIS underestimated that reduction by 50 percent. The additional reductions in Table WLD-20 and Table WLD-21 are the reductions estimated to be caused by the Big Thorne Project in addition to what has already occurred. More explanation of the tables has been added to the FEIS to clarify them. Tables showing the cumulative effects on habitat capability and carrying capacity are included in the DEIS-see Tables WLD-20 and WLD-26.

The commenter has stated that the eleventh bullet in the DEIS (they say p. 3-107 but it is on page 3-110) is incorrect and unrepresentative of how the direct and indirect effects analysis for deer was actually done. The commenter may be referring to the fact that within the WAA boundary, only National Forest System (NFS) lands were used to calculate effects to deer rather all acres including non-National Forest System lands. The bulleted statement that the entire WAAs were used in the estimation of effects to deer for direct and indirect effects means that the NFS lands within the entire WAA boundary were used and not just those NFS lands within the portion of the WAA that is within the project area boundary.

The FEIS acknowledges the deer per square mile at stem exclusion for each WAA. The deer density at stem exclusion is displayed in table WLD-24. The DEIS shows both the percent change as well as the estimated change in deer per square mile.

Deer densities below 18 deer per square mile as displayed by the analysis for the Big Thorne project alone do not necessarily simply there is a viability concern for wolves. The above standard and guideline was designed to maintain equilibrium populations of wolves and deer while also providing for a sustainable harvest of deer by humans (Person et al. 1996). To maintain viable wolf populations under the Forest Plan, the Viable Population committee (VPOP) recommended that a deer density of at least five deer/mi² be maintained in areas where deer are their primary prey (Suring et al. 1993). This is well

below the standard and guideline of 18 deer/mi². In addition, both the 1997 and 2008 Forest Plans disclose that deer density, as measured using habitat capability model outputs, in a number of WAAs may fall below the standard after full implementation of the Forest Plan (Table 3-111, USDA 1997, pp. 3-77 through 3-79 and Table 3.10-9, USDA 2008, pg. 3-284) and that the deer density in some WAAs is naturally low because of poor deer habitat.

The State is concerned that none of the WAAs within the project area currently meet the habitat capability to support 18 deer per square mile (based on model outputs); however, all WAAs within the project area are within what the Forest Plan predicted with full implementation of the Forest Plan. Though there is a scarcity of quantitative data with which to assess actual population levels, The State believes that, while there may be vulnerabilities for wolves in the project area (Person et al. 1996, Person 2001, Person and Russell 2008, Person and Logan 2012), there is not a viability concern for the wolves on the Tongass. Any inconsistency between estimated project effects and those predicted after full implementation of the 1997 and 2008 Forest Plan is important because it suggests the project's effects may be beyond those considered during development of the Forest Plan with regard to the viability assessments. WAAs in the project area are within the percentage change to deer habitat capability disclosed by the 2008 Forest Plan FEIS with full implementation of the Plan; this was a consideration in determining viability at the scale of the Forest.

Alternative 4 took into consideration the effects to deer winter range, both from past harvest and from the current project, and tried to minimize these impacts while still having a viable alternative that met the purpose and need. The DEIS discloses that the proposed project does harvest some of the remaining deer winter range. The units mentioned by the commenter are only proposed in Alternative 3.

The Forest Service discloses that changes in deer abundance resulting from timber harvest and increased road access to deer would affect competition for deer between subsistence users. FEIS p. 3-238 states that past timber harvest has altered the distribution of deer used by the communities in the vicinity of the Big Thorne Project, through changes in the distribution of habitat types and road development. Ongoing and foreseeable timber harvests and associated road construction, as well as other development, would contribute to these effects. The Big Thorne Project, in conjunction with past and foreseeable actions, may further alter the abundance or distribution of deer through reductions in carrying capacity. Also, road construction associated with the past timber harvest has greatly improved access to many areas in the interior of Prince of Wales Island, altering the level of competition in some areas. The upgrading of the main routes connecting the main communities and the ferry terminal on the island to a paved highway has also improved access to many areas. The FEIS p. 3-240 states that collectively, new proposed roads associated with the Big Thorne Project in addition to those resulting from other projects would temporarily improve access and reduce competition. All alternatives would implement the Prince of Wales Island ATM, under which additional road closures would occur as funding allows, reducing access to subsistence resources over the long-term (USDA Forest Service 2009).

The Forest Service acknowledges that high-volume mature forests at low elevations are needed to sustain deer populations during severe winters and that following clearcut

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harvest, deer populations are impacted by the combination of increased snow accumulation that reduces forage availability and the conversion of winter habitat to young-growth stands. The DEIS p. 3-177 says “Thus, regardless of the alternative chosen, all would result in sufficient deer habitat within the biogeographic province and in the WAAs surrounding the project area to maintain a sustainable wolf population.” This statement is incorrect and has been deleted in the FEIS. However, the statement on page 3-179 that says, “Deer habitat capability in the biogeographic province as a whole would remain at 15 deer per square mile at project completion, and would be reduced to 14 deer per square mile at stem exclusion” is correct.

One of the main assumption of the deer model run for the DEIS is that older young-growth stands that have reached stem exclusion are lower-value habitat for deer than younger stands, which have a flush of deer forage. The fawn mortality data and the Brinkman study data have been added to the FEIS. The objective was to develop a mark-recapture technique that used DNA from pellets to overcome the problems associated with estimating abundance of deer in areas where they are hard to see. The Brinkman study which occurred in three intensively harvested watersheds, Maybeso Creek, upper Staney Creek, and upper Steelhead Creek, in north-central Prince of Wales Island determined that deer densities in areas that were logged more than 30 years ago supported about 30 percent fewer deer compared to areas that were logged less than 30 years ago and about 40 percent fewer deer in naturally forested areas. This study also found that by combining all sites and habitat types, the mean estimate of deer density declined 32 percent over the 3-year study from 2006 to 2008.

Wildlife: Deer Model

Commenters had concerns that effects to deer were calculated correctly. They voiced concerns about the scale of analysis as well as the shortcomings of the deer model. There were also concerns as to whether adequate information was provided in the DEIS for the public to make informed comments.

“To better assess potential impacts to deer habitat, we recommend these statistics be calculated and displayed in the Final EIS for the discrete project area in addition to the Wildlife Analysis Area, and biogeographic province scales.”

“In conclusion, we request that the analyses of direct and indirect impacts to deer include all land ownerships, and that the distinction between these and the cumulative analysis be made in other ways.”

“Running the model that way does not portray the 1954 condition, and therefore has corrupted the cumulative impacts analysis.”

“A very important assumption which is inherent to use of model results was not disclosed or discussed in the DEIS. The inherent assumption, absent disclosure and other analysis, is that the loss of deer abundance resulting from reductions in habitat capability follows a linear relationship.”

“The model ignores habitat juxtaposition, patch characteristics, and fragmentation.”

“The model, in representing only the conditions of an average winter, does not take the likely stochastic effects of severe winters into account.”

“The DEIS claims that: “Shortcomings of the model are described in detail in the 2008 Forest Plan Final EIS (USDA Forest Service 2008b).” (DEIS at 3-107). That is false, as just stated. Nor does the DEIS fully and fairly discuss the shortcomings.”

Forest Service Response:

The deer model is a tool used to evaluate the relative differences between alternatives for environmental analysis. Model outputs aid biologists and the public in understanding the effects of different alternatives when planning management activities under complex environmental conditions. Modeling the changes to key features of deer habitat due to implementing planning alternatives provides a method to compare and contrast the relative effects of those planning alternatives to deer carrying capacity (i.e. habitat capability). Direction in the Forest Plan p. 4-95 says, “Use the most recent version of the interagency deer habitat capability model and field validation of local deer habitat conditions to assess deer habitat, unless alternate analysis tools are developed.” At a meeting on August 23, 2011 Tongass National Forest and ADFG personnel met to ensure consistent assessment of deer habitat for project-level analyses related to deer and wolf populations. As a result of that meeting, the "2011 Direction for Project-level Deer, Wolf, and Subsistence Analysis" was developed. This document clarifies that deer model results do not represent actual population density and are not directly related to wolf population viability. Model results represent the functioning of the predator-prey system dynamic (Forest Plan FEIS, p. 3-282), and can be used to estimate the effects of the project on the availability of deer as food for wolves and for subsistence users. The 2011 guidance was used for the Big Thorne Project. The direction in this document is to analyze the direct and indirect effects of the proposed timber harvest on National Forest System land only and cumulative effects on lands in all ownerships.

The deer model was run for the Big Thorne Project according to 2011 interagency direction. The Forest Plan, p. 4-95 says to “conduct analysis at smaller island scale, portions of larger islands or among multiple WAAs”. The analysis of the Big Thorne Project for the effects to deer habitat is done at the individual wildlife analysis area (WAA), group of core WAAs, and at the biogeographic province scales. WAAs are used since they are an analysis area used by ADFG in their management. Biogeographic provinces are large-scale landscape delineations are characterized by 1) similarities in terrestrial wildlife species composition, 2) similarities in distributional patterns for many of these species, 3) geologic and water barriers stemming from past events, such as glaciation, and 4) generally similar climatic conditions and physiographic characteristics. The project area was delineated for the purposes of analyzing an area for a commercial timber harvest contract; it does not have any ecological significance to wildlife populations.

A habitat coefficient (the “HSI score”) refers to the value the deer model assigns to a specific combination of vegetation, snow level, elevation, and aspect of the stand. These coefficients were originally assigned in 1996 for the 1997 Forest Plan and have not changed from 0.0 (worst habitat suitability) to 1.3 (best habitat suitability). Starting with the 2008 Forest Plan analysis, HSI scores were standardized to range from 0 to 1.0 by dividing all values by 1.3, because outputs from such models represent a range from 0 to 100 percent habitat suitability. The highest value is assigned to south-facing, low-elevation (<800 feet), low snow level, high-volume, old-growth stands. The deer model

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does not make distinctions relative to the habitat found in stream buffers. The model assumes the extent that stream buffers will be used by deer is the same as stands elsewhere with same model scores.

The deer model used for the Big Thorne Project assigned a value of zero to all non-National Forest System lands for the cumulative effects of logging on these lands and is therefore less likely to result in an over estimation of deer numbers. The DEIS discloses that the current estimated deer densities at both the individual WAA scale and the at the biogeographic province scale are below 18 deer square mile and what the deer densities are estimated to be both immediately after the project and at the stem exclusion stage.

A limitation of the deer model is that assumes the same ownership in 1954 as the current condition. Accurately recreating the exact vegetation conditions in 1954 is not possible and therefore, a value of zero is used for these lands to avoid overestimating the habitat capability. Although some harvest occurred before 1954, that is the date when large-scale logging associated with the 50-year long-term contracts began. Another limitation is that the deer model assumes a linear relationship between habitat capability and habitat values and does not account for the juxtaposition of the old-growth stands. The patch analysis in the Biodiversity section supplements the deer model in this aspect. Also, the model only accounts for average winters; therefore an analysis of the deep-snow deer habitat was also completed.

Some of the shortcomings of the deer model are discussed in the Forest Plan FEIS on p. 3-231 and 232. More information discussing the deer model can be found in Appendix B, the Tongass Forest Plan FEIS (2008), and supporting documents in the planning record. In addition, a 2012 report “Tongass Interagency Deer Winter Habitat Suitability Index Model” was compiled by the Forest Service to explain the various components of the deer model and the background of these components. One of major shortcomings of the model is that the model cannot accurately predict the actual deer population, only the theoretical deer numbers based on the habitat carrying capacity. The actual deer population may be the same, lower or higher. Actual deer populations cannot be easily assessed in Southeast Alaska due to the dense forest cover and terrain. Deer pellet surveys are done in the spring to attempt to track long-term population trends and should detect population changes over several years (Person and Titus 2002). The deer pellet data are limited in their utility to make inferences about population status or trend. Increased densities may either indicate increased densities or merely shifts in distribution due to a number of factors such as deep snow or hunting pressure by humans and/or predators. On the ground knowledge including the deer pellet transect surveys done by ADFG and the Forest Service has been added to the project record.

Another shortcoming is that the deer model does not make a distinction relative to the habitat found in stream or lake buffers, even though these areas may have deeper snow levels than the surrounding stand. The same habitat coefficients are assigned to these areas. In addition to the use of the deer model, the direct and cumulative effects to deep snow deer habitat, average snow deer habitat, and non-winter deer habitat are analyzed in the EIS. The DEIS discloses the impacts to travel corridors, the effects of road building, and the effects of the proposed project on elevational corridors which are used by those deer who migrate to the alpine in the summer months.

Wildlife: Harvest of Productive Old Growth (POG), Large Tree Productive Old Growth, and Fragmentation

The commenter believes the Forest Service in combination with other landowners has concentrated harvest on POG, especially large tree POG, in the project area and as a result increased fragmentation and decreased connectivity between old-growth blocks.

“The timber industry has already removed half or more of the class 7 stands in existence since 1950. [Exh. 212]. This project seems likely to remove a lot of high volume old growth in a biogeographic province where a third of the high-volume POG and nearly a third of the large-tree POG have been removed over the last half-century. [TLMP FEIS at 3-162]. Private landowners have removed three-quarters of the high-volume POG and 88% of the large-tree POG. [Id.]. This province also once contained nearly half of the karst POG acreage within the Tongass National Forest and half of that has been removed from the province. [Id.]. The BTP proposes to extract as much as 25% of the remaining suitable old growth in the project area. [DEIS at 3-403]. It contemplates logging of various types on as much as 9,649 acres. In light of these previous removals, further analysis should occur at multiple scales and by different landownerships. Further NEPA analysis should specifically evaluate this project in light of remaining large-tree POG before project implementation and after project implementation. This analysis should include a discussion of highgrading at multiple scales and consider state and private lands: (1) at the stand level in terms of past selections of large tree and high value species and future harvests of these species; (2) at the landscape scale and (3) at the biogeographic landscape scale. Towards this end, further NEPA analysis should also disclose and provide maps regarding Forest Service negotiations with Sealaska corporation on potential lands bills. Further NEPA analysis is necessary if the TNF, the State of Alaska and Sealaska all seek to continue their respective timber extraction plans for concentrated timber harvest in a limited area.”

“... we recommend that all Alternatives in the Final EIS be designed to maintain the landscape below timberline in the project area in at least 50 percent cover by productive old-growth and mature second growth forest into the future.”

“This sale will target the remaining essential winter habitat for deer, wolves, and bears.”

“We are concerned because any further timber sales on Prince of Wales Island would negatively affect the wildlife that depends upon the forest.”

Forest Service Response:

The amount of the harvest of productive old growth (POG) is discussed in detail in the DEIS Chapter 3 Issue 3, Wildlife and Subsistence Use, beginning on page 3-93 through 3-101 and 3-133-147. Total POG, High-volume POG (HPOG) and Large Tree POG are analyzed at three scales: the VCU (approximately 10,000 to 20,000 acres), project area (232,000 acres) and the biogeographic province (1,489,549 acres). Patch size analysis is included to show the past effects of fragmentation, the effects of the proposed timber

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harvest on the current condition, and the cumulative effects analysis including any reasonably foreseeable timber harvest projects.

The direct effects analysis included only National Forest System (NFS) lands and the cumulative effects analysis included both NFS lands and non-NFS lands. Non-NFS lands include State of Alaska lands and all private lands including those owned by tribal corporations. The information used for these lands is the best available to the Forest Service and may not be as accurate as the information on NFS lands. There are no selections proposed for exchange for the Sealaska Remaining Land Entitlement and Land legislation within the project area but there are selections within the North Central POW Biogeographic Province as explained in the DEIS pages 3-10 to 3-12. Because of the changing nature of this proposal and the uncertainty of the outcome, the land exchange was not included in the cumulative effects analysis for the FEIS; but the potential land exchange was analyzed with effects to deer, bear, marten and wolves and that analysis was included in the Wildlife Resource Report. The negotiations about this land exchange occur separately from the analysis of this project and maps are not available for the record.

“Highgrading” at the stand level sometimes occurred in the past when the A-frame logging system was used to harvest stands that could be accessed by saltwater. Sometimes only certain species, usually Sitka spruce, or a certain size of trees was harvested. A retrospective study by Deal and Tappenier (2002) of these stands that had been previously partially harvested found that “Concerns about changing tree species composition, lack of spruce regeneration, and greatly reduced stand growth and vigor with partial cuts were largely unsubstantiated. Silvicultural systems based on partial cutting can provide rapidly growing trees for timber production while maintaining complex stand structures with mixtures of spruce and hemlock trees similar to old-growth stands.” The current stands in the study have stand structures similar to uncut old-growth stands, and the cutting had no significant effects on tree species composition.

Uneven-aged management prescriptions (also known as partial harvest) for proposed harvest units currently are based on the tree species composition of the original stand and take into consideration the range of size classes. See Introduction to unit cards for more information. Often the largest trees within a stand are left due to the limitations of the helicopter to lift large loads and the high amount of defect in the largest trees.

The direct effects of POG (POG, HPOG, and large tree POG) are displayed as the effects to the existing or current amount of POG that was in the analysis area—the province, WAA, VCU and/or project area. Cumulative effects to POG (POG, HPOG, and large tree POG) are displayed as the effects of the proposed project added to the effects of past projects to the amount of POG that was estimated to occur in 1954. From the information on Table WLD-15, DEIS p. 3-140, the original (1954) amount of POG in the project area was about 63 percent of the project area due to natural fragmentation. The current amount of POG within the project area is about 42 percent of the area and takes into account natural fragmentation and past harvest. The proposed harvest from the alternatives would remove an additional 4 to 5 percent.

Elsewhere on Prince of Wales Island, the existing POG has been mostly unaltered such as the Honker Divide Old-growth Reserve complex which bisects the project area and the

Karta Wilderness to the south.

See also Timber: Disproportionate Harvest and Timber: Concentrating Timber Sales on Prince of Wales Island.

Wildlife: Goshawks

Commenters have expressed concerns about goshawks and the effects of the project on their habitat; the effectiveness of surveys; effects on the conservation strategy in regards to goshawks, the size of the nest buffers and the availability of prey.

“... the DEIS should include a habitat quality analysis takes into account all available information on differential utilization of various forest types and structure.”

“The DEIS should include material from 2006 Conservation Strategy Review and other material that identify risks of continued and serious population decline associated with further loss of habitat.”

“The DEIS generally takes a simplistic approach to considering goshawk impacts, tying analysis to acres of POG harvested in the biogeographic area. [See DEIS at 3-223]. While that is an important measure, and more harvest is generally worse for goshawks than less harvest, the EIS fails to take to the next step and consider what these reductions mean for goshawk viability. The DEIS notes in passing that reductions may cause increases in home range size in order to gather prey, without telling us why this matters. For action alternatives, the DEIS admits of potential for local reductions in goshawk habitat and prey, with a resulting reduction in goshawk density. [DEIS at 3-225 – 26]. Given the prey issues for goshawks on POW, and the tenuous remaining link to the original TLMP conservation strategy, please give the implications of these studies more careful attention.”

“We recommend that the Final EIS include legacy structure in all clearcut units (and not only along the edges of those units) to provide foraging perches for goshawks and habitat features for other species such as marten and flying squirrel, in all Alternatives.”

“The DEIS however says essentially nothing about the significance of this change, other than that it could result in a reduction of density of goshawks (the same thing it says about every alternative). Are any of the VCUs of higher value than any others for goshawks? Do any contain known nests? Are amounts of interior forest habitat comparable?”

“The proposed actions under the Big Thorne Project will **further reduce essential habitat** available to breeding QCG on POW **beyond the 33% watershed harvesting thresholds** stipulated in the **Forest Plan**, and more importantly, beyond levels that are recommended to sustain viable and well-distributed populations across managed watersheds of the island, thus increasing the risk of extinction of the QGC subspecies (Reynolds et al. 1992, Smith, In Revision).”

“The DEIS should recognize that POW goshawks feed on less abundant and different prey species. [See DEIS at 3-223 (noting that “there is a low abundance

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of goshawks on POW due to the lack of prey.)). Therefore, it is not appropriate to simply tier to a generalized analysis of goshawk prey in Southeast Alaska. Prior habitat loss has created abnormally large foraging areas for goshawks on Prince of Wales Island and further loss of goshawk habitat in the project area could lead to local extirpations. Please provide an analysis of prey availability for project area goshawks. These findings increase uncertainty about conservation measures contributing sufficient habitat to sustain well-distributed, viable populations of northern goshawks throughout Southeast Alaska (Smith, In Revision).”

“The DEIS should also acknowledge the difficulty in discovering additional nest areas, [See TLMP PR #970] and the frequency with which goshawks move nests.”

“Recommend expanding the nest buffers in all Alternatives in the Final EIS, whether located in old growth or second growth, to help provide adequate post-fledging areas for a typical cluster of alternate nests.”

“To minimize the probability of cutting a goshawk nest stand, we recommend that all Alternatives in the Final EIS include a commitment to survey for goshawk nests annually in all selected harvest units until those units are cut.”

“The FEIS should include information on the USFSs goshawk monitoring program and the effectiveness of nest buffers for providing successful nesting by breeding pairs.”

Forest Service Response:

The Queen Charlotte goshawk, and other threatened, endangered, and sensitive species are discussed in detail in the Biological Assessment and Biological Evaluation (BA/BE) since the goshawk is an Alaska Region sensitive species. The BA/BE makes the determination “May impact individuals but not likely to cause a trend to federal listing or a loss of viability.” The literature provided by the commenters have been reviewed and cited if relevant.

The section pertaining to goshawk in the BA/BE for the Big Thorne Project includes analysis of both productive old growth (POG) and high-volume POG (HPOG). These two habitats are analyzed because they are thought to be the most important to goshawks in terms of nesting habitat (large trees) and foraging habitat (most prey are old-growth associated species). POG and HPOG analysis by both biogeographic province and VCU are in the BA/BE (Table 5-4). See BA/BE p. 24-27; and 37-44. Effects to POG and HPOG as well as large tree POG are disclosed in the Biodiversity section of the DEIS and the FEIS. Information on changes to interior forest acres has been added to the FEIS.

The POG analysis was done at the VCU scale because that was the scale for previous Forest Plans and the scale at which the legacy forest structure standard and guideline is determined (by past POG harvest) and applied. None of the VCUs in the project area or province have only 16 percent of the original POG remaining. There are tables in the Biodiversity section that show the amount of POG by VCU for 1954, current and post project (Table WLD 12, 13 and 14). The Legacy Forest Structure Standard and Guideline will not be applied to all proposed timber harvest units since the objective of this is to ensure there is enough forest structure within a VCU to provide the full range of the

conservation strategy matrix function. Annual Forest Plan Monitoring Reports track the implementation of the Legacy Standard and Guidelines; however, there has not been a thorough evaluation of the effectiveness of the Legacy Forest Structure Standard and Guideline. The current 5-year review of the Forest Plan provides an opportunity to provide input in this regard.

Changes to potential goshawk habitat protected by the small OGRs due to the proposed small OGR boundary modifications is discussed in Chapter 3, issue 2. The decrease of 669 acres of HPOG is the total acres of HPOG that are no longer in the OGRs as proposed for modification in Alternative 3. The HPOG lost by VCU due to the proposed OGR modifications in Alternative 3 ranges from no change in acres (one VCU); four VCUs had less than 100 acres removed; and four VCUs had more than 100 acres removed. Two VCUs increased the acres of HPOG in the OGRs—one by 28 acres and the other by 530 acres. None of the OGRs contain any known goshawk nests; surveys have been or will be done in the units added to the unit pool as a result of the OGR modifications. The analysis included in the DEIS, in Table OGR-2 displays the potential nesting habitat within current OGRs and the effects to the potential nesting habitat due to the proposed modifications of the OGRs in Alternatives 3 and 4.

The 33 percent harvest threshold by VCU for goshawks on POW was a standard and guideline under the 1997 Forest Plan. There is no threshold in the current 2008 Forest Plan. The Big Thorne EIS discloses that the project will reduce the POG in several VCUs. Six VCUs on the project area with proposed activity have already had more than 33 percent of the original POG harvested and therefore have the Legacy Forest Structure Standard and Guideline applied (See Table WLD-15). In comparing the two 1997 goshawk standard and guideline with the 2008 legacy forest structure standard and guideline, there is no difference in application in any of the VCUs where the Big Thorne EIS is proposing any activity. VCU 5972 is right at the 33 percent harvest in 2008 so it may not have had the 1997 standard applied, but the 2008 legacy standard does apply. The only other VCU with a difference in the project area is VCU 5980, where no timber harvest is proposed under the Big Thorne Project.

Retention of POG in the form of riparian management areas, beach buffers and legacy forest structure, as well as silviculture prescription changes from clearcut to partial harvest between the DEIS and FEIS maintain habitat in the matrix.

Cumulative reductions in nesting and foraging habitat in the Prince of Wales Island biogeographic province could result in the local expansion of individual goshawk home ranges, potentially leading to a reduction in breeding density. Effects would be greatest under Alternative 3, followed by Alternatives 2, 5, 4, and 1. However, given that goshawks are highly mobile and that breeding density is currently low within the Prince of Wales Island biogeographic province, the effects of the Big Thorne Project in combination with past, present, and foreseeable activities would result in a “moderate effect to goshawks in the North Central Prince of Wales biogeographic province (BA/BE p. 43).”

Effects to various prey species are discussed in the sections on POW flying squirrel, spruce grouse, endemic mammals, cavity-nesting bird species and migratory birds in Chapter 3, Issue 3: Wildlife and Subsistence Use.

Goshawk surveys have been conducted to minimize the chances of harvesting a nest tree;

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however, goshawk nests can be difficult find (see Schempf et. al. 1996; Evaluating and Developing Survey Techniques Using Broadcast Conspecific Calls for Northern Goshawks in Minnesota, A. Roberson; Efficiency of Northern Goshawk Broadcast Surveys in Washington State, Watson et al. 2000; Survey Methodology for Northern Goshawks in the Pacific Southwest Region, US Forest Service, Queen Charlotte Goshawk Status Review U.S. Fish and Wildlife Service Alaska Region Juneau Fish and Wildlife Field Office April 25, 2007). Any nests discovered during implementation or during the contract will have the nest buffer required by the Forest Plan applied. The Forest Plan requires a 100-acre buffer on all active goshawk nests. The active nest that was discovered in the Steelhead drainage has the required 100-acre buffer in place. In reality, there are more than 100 acres in the vicinity of this nest that will not be affected by the proposed timber harvest. There is also a nearby (about 1 mile away) inventoried roadless area where POG will be maintained.

Monitoring information is collected annually. The 5-year monitoring report is under review at this time, and will be posted to the public website for the Tongass when completed.

The 2008 Forest Plan enhancements include: “a net addition of acres to the old-growth reserve network; improvements in the configuration of small reserves recommended by the interagency team; and the additions to other non-development LUDs that are part of this decision. The enhanced reserve network in the amended Forest Plan, coupled with the 1,000-foot wide beach buffers and other features that provide habitat connectivity, should provide a similar if not stronger foundation for maintaining goshawk populations across the Tongass. The Forest Plan concluded that an abundant supply of habitat suitable for goshawk nesting and foraging will persist across the Tongass”. Also confirmed goshawk nests continue to be protected by a 100-acre buffer of old-growth habitat in perpetuity.

Wildlife: Marten

Commenters expressed concerns about the effects of the project to marten and how the effects were analyzed.

“Please provide a detailed explanation regarding the application of the marten habitat capability model for this project. In particular please address how elevational considerations, habitat fragmentation and application of the road density factor and prey availability will be considered in the assessment of habitat suitability for marten.”

“If you use the deep snow model please provide a detailed explanation including inputs and limitations and any comments by ADFG.”

“The interagency habitat capability model {Exh 66} calculates Habitat Suitability Index (HSI) based on timber volume strata, elevation and typical snow-fall. Please document the use of this model and results even if also use the deep snow model. Please incorporate road density factor appended to the Suring model in the marten habitat analysis and include both open and closed roads. We request that the DEIS display habitat losses under both models, and provide sufficient scientific evidence

to support chosen methodology including an explanation for the change to deep-snow habitat model.”

“Finally further NEPA analysis should review materials from the 2006 Conservation Strategy Review Workshop and particular discussions and recommendations from marten specialist Mereav Ben-David and Rod Flynn. Their recommendations should be incorporated into any further analysis of OGR modifications and analysis of OGR qualities that are specific to marten.”

“The DEIS failed to provide a through assessment of the impacts of increased road density on marten. We requested that the DEIS review and discuss the more recent work by small mammal biologists indicating the road density increases pose a significant risk to marten including the concern that high road densities may lead to local extirpations. But the DEIS simply disclosed the road densities for all elevations and failed to assess the implications of these road densities for marten.”

Forest Service Response:

The Interagency habitat marten model was not used for the Big Thorne Project. In November 2008, Forest Service wildlife biologists agreed that a more-comprehensive habitat analysis which includes both an analysis of all productive old-growth (POG) and one of the deep-snow marten habitat would be used. Deep-snow winter marten habitat is defined as high-volume productive old growth (HPOG) and located at elevations that are up to 800 feet in elevation. HPOG is defined in the FEIS (p. 3-43) as stands categorized in the Size Density model as SD-5S, SD-5N and SD-67. The change to this method from the Forest Plan marten habitat capability model has been used for other timber harvest environmental analyses. These analyses differ in the reduced elevation considered to be important marten winter habitat, with the deep-snow habitat using 800 feet in elevation, and the marten habitat capability model using two different elevations-habitat below 800 feet and habitat greater than 800 but less than 1,500 feet in elevation (habitat greater than 1,500 feet was given a zero value). The deep-snow marten habitat analysis uses the size density model (SDM) instead of the volume classes used in the Forest Plan marten model; therefore acres of volume class 5 on hydric soils, a less-productive forest, is not considered as deep-snow winter habitat. The deep-snow marten habitat analysis is more conservative than the Forest Plan marten model developed for the 1997 analysis and used by the panel to assess the effects (1997 Forest Plan FEIS, Appendix N). The results of this analysis are displayed in the DEIS, p. 3-186, Table WLD-27 and cumulative effects is on page 3-188, Table WLD-29. Cumulative effects include known and reasonably foreseeable harvest on non-National Forest System lands.

The Biodiversity analysis included the effects of the proposed timber harvest on POG, HPOG, and large-tree POG and is in the DEIS, pp. 3-132 to 3-142. This analysis also includes the effects to numbers of patch sizes, DEIS, p. 3-141, WLD-16. An analysis of the effects to wildlife travel corridors is also included in the DEIS, p. 3-103 to 3-106. These corridors, along with riparian management areas, allow for dispersal of marten. Although they selected against it, marten seemed to readily travel across areas of noncommercial forest as well as POG and young growth forest.

The recommendations of from the Conservation Strategy Workshop were considered

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during the analysis of the 2008 Forest Plan Amendment EIS. Recent studies that supported the conservation strategy were reviewed with the 2008 Forest Plan Amendment. The Marten Standard and Guideline which allowed uniform spacing of reserve trees was replaced by the Legacy Forest Structure Standard and Guideline to ensure that those VCU's where timber harvest greater than 33 percent has occurred or where greater than 67 percent is expected to occur retained sufficient trees for the functions of the matrix.

The Big Thorne FEIS discusses the effects of increased road density by alternative and the risks to marten associated with those increases. An analysis of both the open and total road density for the WAA for roads 1,500 feet and under in elevation used National Forest System (NFS) lands for direct effects, and NFS and non-NFS lands for cumulative effects. In line with the recommendations from the conservation strategy workshop, no road density standard has been set to assess marten vulnerability, but rather the effects analysis based on the amount of POG and connectivity was used across the landscape using both the project area and the biogeographic province. Road closures were considered to reduce trapping pressure with the analysis on wolves.

Wildlife: Wolves/Wolf Mortality and Road Density

Commenters have expressed concerns that the DEIS did not adequately address impacts to wolves and wolf mortality; wolf habitat and effects of increased road density.

“DEIS did not adequately address impacts to wolves and wolf viability. DEIS uses “largely unsupported wishful thinking” saying that low deer numbers in area overcome by wolf mobility and “potential” benefits of second growth management and road density by controlling hunter access and the importance of the Honker and Karta. Superficial view of ecology of wolves fails to rely on expert with local knowledge.”

“DEIS misrepresents wolf populations; Need to disclose that the wolf population has declined significantly and available knowledge of this decline from extensive efforts by well-respected wolf researcher need to be fully and fairly discussed. Commenter suggests that by presenting both views but not evaluating them favors the optimistic. DEIS fails to mention currently depleted numbers. Text about current functioning in the DEIS needs to be clear about what portions of the 16 year old study are pertinent.”

“Additional logging such as that proposed in the Big Thorne project would result in further loss of habitat (including denning sites), pack dispersal, and loss of prey species, notably the Sitka black-tailed deer.”

“The Wolf Task Force meeting notes contain a list of many questions that need answers before the FEIS is created.”

“The effects of the Big Thorne Timber Sale Project on the viability of wolves must be studied on an island by island basis. The latest scientific information must be used to create the FEIS and must be available to the public before comments on the FEIS are called for.”

“Claim the wolf S&G not met so look at larger scale; same with road density.”

“The Forest Service must demand a response from the Secretary before the FEIS is addressed, and this response must be made readily available to the public.”

This project offers an important opportunity to address a critical conservation need for Alexander Archipelago wolves by including targeted road closures in areas where wolf vulnerability to human harvest is high. To reduce harvest risk for wolves in the project area, we recommend additional strategically-targeted road closures be identified as part of all the Alternatives and be included in the Final EIS.

“Big Thorne interdisciplinary team could likely develop specific road closure proposals.”

“Project already exceeds road densities considered optimal for deer and wolves and proposes to build more roads. Will increase the risk that USFWS will find protection mechanisms inadequate and cause wolf to be listed.”

“The wolf survivability and road density analysis was not complete and made logical errors about mitigating outside the project area and ignored effects from adjacent lands within the project area.”

“Discussions on pp. 3-112, 3-173, 3-178, 3-179, and elsewhere, imply that the road density threshold of 1.5 mi/mi² (0.9 kilometers per square kilometer (km/km²)) identified by Person and Russell (2008) may be a suitable target road density for management, or that increasing road densities beyond this level is acceptable because further increases in wolf mortality would not be expected. In fact, this road density was associated with highly variable harvest rates, wolf population declines, and probable local extirpations (Person and Russell 2008, p. 1547). Person and Russell (2008) found that even the 1997 Forest Plan’s more protective guideline of 0.7 miles of open roads per square mile (0.43 km per square km) entailed “considerable risk of facilitating chronic unsustainable mortality.” “Person still concerned about higher densities.”

“To provide meaningful disclosure of effects, in addition to the road densities shown for individual Wildlife Analysis Areas, the Final EIS needs to include road density calculations for the entirety of Prince of Wales Island and for the entire project area under each Alternative (Draft EIS, Table WLD-24, p. 3-173).”

“While hunters and trappers do harvest wolves along closed roads, open roads are believed to present greater risks to wolves because of higher human use of those roads. The greatest reductions in mortality risks are likely to result from decommissioning roads along valley bottoms (Person and Logan 2012, p. 24) and across open habitats such as muskegs and clearcuts (Person and Russell 2008, p. 1548).”

“This project area already exceeds the number of road miles optimal for deer and wolves, and the plan propose to build even more roads. Wolves and deer would suffer from fragmentation, and additional roads could result in more hunting and trapping pressure, along with more poaching, especially regarding wolves. The

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TLMP Conservation Strategy Review states that "illegal killing of wolves and deer will make it difficult to regulate harvests unless access is controlled."

"Forest Plan standards call for maintaining deer habitat capability adequate to support at least 18 deer per square mile, using the most recent version of the interagency deer habitat capability model, in areas where deer are used by both wolves and subsistence hunters (Forest Plan, p. 4-95). We are concerned that not only is deer habitat capability already well below the Forest Plan guideline level across the project area (i.e., ranging from 6 to 16 deer per square mile, depending on the Wildlife Analysis Area), under Alternatives 2 through 4, deer habitat capability is projected to decline further (Draft EIS, p. 3-175). We are also concerned that at the larger biogeographic province scale, deer habitat capability is projected to decline under all the action Alternatives from 15 to 14 deer per square mile (Draft EIS, p. 3-174). To better assess potential impacts to deer habitat, we recommend these statistics be calculated and displayed in the Final EIS for the discrete project area, in addition to the Wildlife Analysis Area, and biogeographic province scales."

"Thinks ample accommodations made for deer and wolf habitat and populations both appear healthy and well managed."

"Big Thorne proposed action does adequately address wolf mortality".

Forest Service Response:

The DEIS addresses impacts to wolves and wolf viability. The low deer numbers in one area can potentially be overcome by wolf mobility; however, wolf pack territoriality can preclude shifting of home ranges and territories. The Forest Service also believes that the benefits of thinning, both pre-commercial and commercial, can benefit deer (and wolves) by improving deer habitat in the long term. The impacts of road densities are analyzed in the document. The importance of large reserve areas, such as the Honker and the Karta, are acknowledged in the research of Dr. Person as cited in the DEIS. The Forest Service does rely on experts with local knowledge. The views of Dr. Person are acknowledged and incorporated in the DEIS: Person 1996; Person and Russell 2008; and Person and Logan 2012.

Although wolf population viability has a high likelihood of being maintained, concerns have been expressed on wolf sustainability. These concerns are at a more-localized scale than the viability concerns. The Forest Service is working with other Federal and State agencies to address these concerns. An interagency meeting was held at the USFS Southeast Alaska Discovery Center on April 9, 2013. The purpose of this meeting was to discuss the wolf population sustainability issue on Central Prince of Wales, and specifically the Big Thorne project area. Topics discussed by the group included road/access management, deer habitat enhancement, and pre- and post-treatment monitoring of the thinning sites. The group agreed on several priority sites for commercial thinning treatments that would benefit deer, such as those in the area northwest of Thorne Bay, the Sal Creek, Ratz Harbor and Little Ratz Harbor areas. The group also recognized that actions beyond the scope of the Big Thorne Project may be meaningful to wolf management at the scale of GMU2 or smaller (i.e. the biogeographic

province). The interagency group will continue to evaluate these measures and also others such as including development of season and harvest limit proposals for submission to ADFG Board of Game and Federal Subsistence Boards; and development of a wolf habitat management program, including road access management in conjunction with ADFG. The Forest Service will continue to work with ADFG and USFWS as part of a technical working group to fill information gaps and evaluate potential conservation measures identified by the group that initially met October 2011.

The Forest Service presents different views to display that opposing opinions were considered and disclosed. Both the DEIS and the FEIS do disclose the information that wolf populations on Prince of Wales may be as low as 150 wolves, as discussed in Chapter 3, Issue 3: Wildlife and Subsistence Use. The DEIS mentions the current estimated numbers on page 3-114, "At the November 2010 Board of Game meeting in Ketchikan, ADFG reported that anecdotal observations by state and Federal biologists, trappers, and hunting outfitters/guides suggested the wolf population had declined to as few as 150 wolves in GMU 2, and that a harvest cap of 45 wolves (30 percent of the population estimated by ADFG) might be appropriate."

The DEIS acknowledges that the proposed project will result in further habitat loss for deer, potential wolf denning sites, and may effect pack dispersal. The DEIS discloses road densities, both open and closed, as well National Forest System only and roads in all ownerships, at both the WAA scale and the entire island. The fact that dispersing wolves have an increased susceptibility to trapping related mortality is disclosed in the DEIS.

Rather than address wolves (via effects to deer) on an island scale, the DEIS analyzes wolves by WAA at the scale of the North-central Prince of Wales Biogeographic Province according to the Forest Plan p. 4-95 which states, "Conduct analysis for smaller islands, portions of larger islands, or among multiple WAAs." This analysis was conducted in support of the Forest Plan (FP FEIS 1997 VPOP and 2008 FEIS); it was a big driver in development of the conservation strategy. The estimated road densities at the island scale are acknowledged in the DEIS.

The DEIS discloses that the 18 deer per square mile is not currently being met within some WAAs and the biogeographic province scale.

Population viability is addressed at the Forest Plan level to comply with NFMA. The viability of the wolf population has been addressed in the 2008 Forest Plan Amendment FEIS, Volume 1 (p. 3-284 and 3-285) and in the decision for the Amendment (p. 20). NFMA requires forest plans to "provide for multiple use and sustained yield of the products and services" obtained from the National Forest System (16 U.S.C. § 1604(e)(1)).

To meet this viability requirement for the Forest Plan, the Tongass relied in part on the findings of structured viability risk assessment panels, consisting of subject matter experts. The panels assembled for the 1997 Tongass Forest Plan concluded that it is highly likely that viable and well-distributed populations of wolves would be maintained through 100+ years of implementing the Selected Alternative of the 1997 Forest Plan (1997 FEIS p. 3-406). These same panel assessments were used for the 2008 Amendment of the Forest Plan. The decision was assigned a high likelihood of maintaining viable well-distributed wolf populations (2008 FEIS p. D-81).

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To address habitat and sustainability on a Forest scale, the Forest Service has identified a system of old-growth reserves to support viable and well-distributed populations of old-growth associated species (Forest Plan FEIS, p. 2-3). In 1993, an interagency committee of wildlife biologists was commissioned to identify species sensitive to modification of old growth and to make recommendations for habitat conservation measures for the revision of the Forest Plan that would maintain viable and well-distributed populations (Suring et.al. 1993). Now known as the VPOP committee, their recommendations became the cornerstones of the Tongass Conservation Strategy. The Strategy is based on a network of old-growth reserves as well as measures (i.e., standards and guidelines) that apply outside of the reserves. The committee made species-specific recommendations where needed. An integrated old-growth conservation strategy was developed to provide old-growth habitats in combination with other non-development LUDs to maintain viable populations of native and desired non-native fish and wildlife species and subspecies that may be associated with old-growth forests (Forest Plan FEIS, pp. 3-174 to 3-175). The Forest Plan decision (ROD, p. 15) states that the Conservation Strategy ensures the maintenance of long-term viability for wildlife species by means of a comprehensive approach based on principles of conservation biology.

The USFWS is currently considering a petition for listing the wolf under the ESA. Updated information (ie. the determination) on the wolf ESA petition is not available at this time of writing, but will be included in the FEIS if it becomes available.

As concerning considering specific road closures to reduce wolf vulnerability: The relationship of the Big Thorne Project and the POW ATM Plan is discussed in the FEIS Chapter 1 and in the Transportation Resource report. No changes are being proposed to the Objective Maintenance Level and Road Management Objectives designated in the Prince of Wales ATM. Effects of roads are analyzed in the respective resource section.

All new temporary roads will be decommissioned after harvest activities. The POW ATM-Table 2-8 p. 36 states that Alternative 1: “Would be beneficial by reducing the open road density on lands of all ownerships from 0.80 to 0.70 miles per square mile from the existing condition and would benefit wolves from reduced human disturbances caused from vehicle traffic, over-trapping, hunting, poaching, and recreational shooting. Negatively affects wolves by allowing the existing motorized travel in OGRs, which removes or disperses prey species (deer) resulting from human hunting activities or associated disturbances.” The table states for Alternative 2: “Same as Alternative 1 except that there is a greater potential for reduction in human disturbance and there are more road reductions in and adjacent to OGRs that would reduce habitat fragmentation.” The above-mentioned interagency meeting (April 9, 2013) included recommendations for closing or using seasonal restrictions by gates for roads that access the Honker Divide area, such as Roads 2052000, 3035350, 3035400, 3035500, and 3037700. The Honker Divide area is known to provide refugia for one or more wolf packs that may function as sources of dispersing wolves to help reestablish packs in areas otherwise depleted of wolves by human-caused mortality (Person and Russell 2008, Person and Logan 2012).

The Big Thorne Project acknowledges that both current and projected road densities are higher than what is considered optimal for wolves. Both current and post-project road density estimations are acknowledged and analyzed in the document.

The analysis on wolf sustainability and road densities is covered in detail in the DEIS. Impacts to wolves are tied directly to impacts to deer. The effects to deer outside the project area are acknowledged in the estimated deer numbers for all the WAAs in the biogeographic province. The effects to deer on adjacent lands are taken into account in the deer model by assigning all these lands a zero value in the deer model.

The current and projected road densities are acknowledged and the effects of these densities are analyzed in the Big Thorne EIS. The DEIS acknowledges that the current and expected road densities are above what may be considered optimal for deer and wolves. The Big Thorne Project results in only a very slight increase from the current road densities. There is no road density threshold identified for deer. Issue 3 in the FEIS discusses effects to wolves for current and projected estimated road densities below 1,200 feet in elevation on both National Forest System lands only and all lands. Both open and total road density estimates are shown.

Illegal harvest of wolves is included in the analysis of wolves in the DEIS. All temporary roads build for this project will be closed at the end of the sale; other roads will be closed under the POW ATM. While illegal take is difficult to regulate, the Forest Plan includes direction for the Forest Service and ADFG to work together to mitigate effects to wolves involving both managing access and changes to season and harvest regulations. The DEIS also includes an estimated effect of illegal take to wolves (Forest Plan p. 4-95).

Wildlife: Wolf Habitat Management Program

Some commenters said that the Forest Service needed to develop a Wolf Habitat Management Program.”

“The Tongass Land and Resources Management Plan (2008) (Forest Plan) addresses wolf harvest vulnerability by requiring the U.S. Forest Service (USFS) to work with the Alaska Department of Fish and Game (ADFG) and FWS to develop a Wolf Habitat Management Program to include road access management and wolf harvest management proposals where wolf mortality concerns have been identified. The Forest Plan requires incorporation of wolf mortality findings into travel management planning and hunting/trapping regulatory planning where interagency analysis determines that road access and associated human-caused mortality is a significant contributing factor to locally unsustainable wolf mortality (Forest Plan, p. 4-95). The analysis of Person and Logan (2012) meets this Forest Plan criterion. We recommend the Final EIS include a requirement for updating relevant portions of the Access and Travel Management (ATM) plan based on analysis of roads in the Big Thorne project area.”

“The Big Thorne DEIS is deficient without such a program.”

“10 year project time frame. No results from Wolf Habitat management program.

Forest Service Response:

The Forest Service is committed to working with interagency partners to address the issues and information gaps identified at an October 2011 interagency meeting to discuss wolf management in GMU2, including development of season and harvest limit proposals

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for submission to ADFG Board of Game and Federal Subsistence Boards, and development of a wolf habitat management program (including road access management) in conjunction with ADFG. The Forest Service will continue to work with ADFG and USFWS as part of a technical working group to fill information gaps and evaluate potential conservation measures identified by the group that initially met October 2011 (see project file). Collaboration with ADFG on a Wolf Habitat Management Plan will include consideration of the Forest Plan p. 4-95 which states that “a road density of 0.7 to 1.0 mile per square mile or less may be necessary to reduce harvest-related mortality risk where locally unsustainable wolf mortality has been identified.” The Forest Plan (p. 4-95) also provides direction to address sustainable wolf harvest issues through access management and State and Federal harvest, and states, “to assist in managing legal and illegal wolf mortality rates to within sustainable levels, integrate the Wolf Habitat Management Program (including road access management) with season and harvest limit proposals to federal and state boards.”

The Forest Service acknowledges that the wolf task force group has not met in over a year and that no decisions have been made by that group to date. However, at the time of writing, the Forest Service and ADF&G have had a successful first year of a project to develop robust monitoring protocols for wolves in GMU2; this project is ongoing and is a direct response to the information need identified by the interagency wolf group. The DEIS discloses that threats to the sustainability of wolves in the project area WAAs may exist. It also discloses the fact of the active ESA petition.

Requiring changes to another NEPA document, such as updating the POW ATM, is beyond the scope of this project. The Forest considered access management to address the mortality concerns expressed by ADFG, USFWS, and other commenters.

Wildlife: Prince of Wales Flying Squirrel and other Endemic mammals

Several comments were received about concerns of impacts of the project to the Prince of Wales flying squirrel and other endemic mammals.

“We requested that you review the relevant scientific material such as the studies of Joseph Cook et al. included in the TLMP planning record and discuss the cumulative impacts of logging on dispersal and isolation of endemic mammal populations. We also requested that you contact Dr. Cook and seek out and review and discuss any studies done after the completion of the 2008 TLMP amendment. We have also included as an exhibit a letter from Dr. Natalie Dawson, who is one of the foremost experts on Tongass endemic and small mammals. [Exh-66]. Dr. Dawson has previously expressed concern with intensive logging on POW and reiterates that concern in her letter.”

“As an initial matter, the further NEPA analysis needs to provide a more thorough assessment of project level effects on small and endemic mammals. Adequate surveys have not been conducted on many portions of larger islands.”

“We also think that it is imperative to conduct “additional viability assessments for the various identified endemism zones ... to check that conservation strategy will maintain viable populations of these species within these zones.”

“The DEIS needed to do these assessments for POW endemic mammals. The following comments pertain specifically to the northern flying squirrel. But the concerns that range from poor quality analysis to poor quality OGRs pertain to all small mammal habitat specialists. The DEIS generally measures impacts in terms of broad scale removals of POG without consideration of specific habitat needs, specific connectivity and fragmentation sensitivities or species-specific risks of localized extirpations.”

“Analysis in the Big Thorne DEIS fails to adequately consider impacts to the Prince of Wales Flying Squirrel (*Glaucomys sabrinus griseifrons*) and instead relies on the outdated conservation strategies of the TLMP. By doing so, the analysis neglects to incorporate the best scientific information available, most glaringly information from scientists with many years experience working with Tongass and POW endemic species (see attached and discussion in section XX regarding Mr. Person’s input on Big Thorne).”

“The alternatives analysis in the Big Thorne DEIS relies on Forest Plan standards and guidelines to support suitable habitat for POW flying squirrel under all alternatives, and does not acknowledge recent studies [2006 Conservation Strategy Review] demonstrating that these TLMP standards are not adequate for POW flying squirrel. Based on this, the Big Thorne DEIS reaches the conclusion that only local population reductions for POW flying squirrel would occur under all action alternatives. This conclusion is in error, and is not based on the best available science.”

“Below, I present findings that support the conclusions that existing habitat and landscape condition do not support 1) functionally connected populations of POW flying squirrels without which viable populations will unlikely persists on north POW.”

“The result of all of this is that young squirrels have a very low probability of natal dispersal in managed landscapes of north POW and more than 50% of the POG habitat patches (OGRs, stream and shoreline buffers, OG LUD, etc.) are not functionally connected (Smith et al. 2011). ‘The proposed actions in the Big Thorne Project will further fragment and isolate POG patches and POW flying squirrel populations, all of which will increase the risk of extinction in managed watersheds of north POW. Moreover, because of obligate or facultative symbiotic relationships between POW flying squirrels and multiple members of its forest community (Smith 2012), significant biodiversity is also at risk.”

Forest Service Response:

An endemic species is a distinct, unique organism found within a restricted area or range. A restricted range may be an island, or a group of islands, and in the case of some endemic mammals within the Alexander Archipelago, a restricted region such as the North Pacific Coast. The term “endemism” holds special importance on island systems,

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because many organisms are restricted in distribution to a single island or groups of islands.

The Tongass National Forest in cooperation with the Island Surveys to Locate Endemic Species (ISLES) program has conducted small mammal surveys since 1991. Small mammal trapping is usually conducted from mid-July to August when populations are at their peak and the ability to detect and capture less-common species is greatest. Field surveys consist of both targeted and opportunistic sampling that employs different trapping techniques. While conducting field inventories, a primary focus of all efforts is to document the full diversity of species present. Through this cooperation, the Forest Service receives the latest information about these surveys. More information can be found on the ISLES website - http://www.msb.unm.edu/mammals/ISLES_website_final_20091028/isles_home.html.

Surveys have been done to the extent practicable but have focused on islands of high refugial endemism, and connectivity potential and/or in areas where there is inadequate existing information. Recent surveys have been on the Outer Islands to the west of Prince of Wales Island which better meet the criteria of the Forest Plan Standard and Guideline (Forest Plan p. 4-97). Surveys will continue to be done by ISLES, although will probably continue to focus on Southeast Alaska islands. Surveys should only be necessary for islands less than 50,000 acres and/or in areas where there is very little or no existing information. Prince of Wales Island is both larger than 50,000 acres and there is adequate existing information for the endemic species.

No direct or indirect effects to the Haida Gwaii ermine are anticipated under any of the alternatives because this species is associated with low-elevation riparian and shoreline areas which are protected by the Forest Plan Standards and Guidelines as part of the matrix component of the Forest Plan Conservation Strategy. The direct effects analysis for endemic species in the DEIS focuses on the Keen's myotis, which is associated with large trees and snags present in POG (Boland et al. 2009). The DEIS also analyzes the effects to other endemic species in the wolf, bear and Prince of Wales spruce grouse and flying squirrel sections.

For endemic mammal analysis existing information (Cook, Smith, MacDonald, Dawson and others) was used to define the presence of endemic species. To achieve this, a literature review was done for the DEIS, which included most of the publications mentioned by the commenter, and relevant information cited including Dawson 2007, Cook et al., 2001, 2006, and 2007. See Chapter 4 for a list of these references which have been updated for the FEIS. In addition, since this project tiers to the Forest Plan FEIS, all of the publications cited/referenced there are included here by reference. In response to the some of the concerns raised by Dawson, please see the responses to comments in the wolf section.

The effects of the proposed timber harvest and resulting fragmentation of old-growth forest on the dispersal potential of the Prince of Wales flying squirrel are discussed in the DEIS. The effects to the squirrel are analyzed because it has a known dispersal distance limit of 250 feet (Smith et al., 2005). Other endemic species do not have known dispersal distance limitations and therefore, the effects cannot be analyzed with the same assurance. Some endemic species such as the wolf and bear likely have large dispersal distance

limitations and others likely have much shorter dispersal distances.

The DEIS includes much discussion on connectivity and corridors in the project area. The DEIS does discuss the connectivity of the OGRs specifically in relation to flying squirrels and their dispersal distance (250 feet) see DEIS p. 3-210-216. Based on the maximum reserve spacing suggested by Smith et al. (2011) of 0.6 mile (1 km), functional connectivity for flying squirrels with the OGR modifications under Alternative 3 are disclosed. See also the OGR discussion.

In addition to the old-growth reserves, the Forest Plan Standards and Guidelines contribute to retaining suitable habitat for POW flying squirrels under all alternatives through implementation of the Legacy Forest Structure Standard and Guideline which was designed to maintain POG structure in those VCUs where concentrated previous timber harvest has occurred and which are at risk for not providing the matrix function. Also, the riparian and beach and estuary fringe standards contribute to suitable habitat and connectivity for squirrels. Based on these protections, the Big Thorne DEIS reaches the conclusion that localized population reductions for POW flying squirrels may occur under all action alternatives; however, the range of effects is within those disclosed by the Forest Plan FEIS to which this analysis tiers.

POG occurs in patches in the project area, since this area is fragmented both naturally and due to past harvest activities. The DEIS acknowledges that the increase in fragmentation from the proposed timber harvest will likely increase the risk to flying squirrels. The Big Thorne DEIS includes an analysis of productive old growth patches and acknowledges that the number of patches in the smaller size class will increase as a result of this project. The DEIS includes an analysis of connectivity and fragmentation; and changes in patch sizes. The section on flying squirrels includes an analysis specific to the distance that flying squirrels are thought to be able to travel.

Smith, Person, and Pyare (2011) discusses that the minimum patch size to sustain [flying squirrel] populations with a high probability of persistence was larger than the “preferred” prescription of 650 hectare reserves (about 1,600 acres) with a composition of 50 percent or greater productive old-growth forest and references the 1997 Forest Plan, Appendix K for this prescription. They found that small OGRs that meet a minimum prescription of 25 percent productive old-growth (POG) should probably be less than 850 meters (about ½ mile) from other reserves. Small OGRs comprised of 50 percent or greater of productive old growth can probably be spaced at 1 kilometer (0.6 mile) intervals in landscapes composed of old-growth forests.

Forest Plan Appendix K criteria for both the 1997 and 2008 Forest Plans is 16 percent of the total area of the VCU, which may vary in size, and POG needs to be 50 percent of the 16 percent total acres. Also, there are no criteria for connectivity between small OGRs in the Forest Plan. Small OGRs were established in part to provide connectivity between large and medium OGRs. The DEIS does include a discussion on probable wildlife travel corridors between current OGRs and the impacts of the proposed modifications.

Smith et al. (2011) also concludes that most small OGRs on Prince of Wales Island (as described in the 1997 Forest Plan; USDA Forest Service 1997) were not functionally connected. However, the POG component of a large OGR may not need to be contiguous because interspersed low productive old-growth habitats clearly can support flying

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squirrels for a short time and likely facilitate dispersal between patches of POG. Maximum effective dispersal distance for northern flying squirrels was about 0.6 mile (1 kilometer or less), whereas the mean expected distance between small OGRs to achieve well-distributed populations (USDA Forest Service 1997) was about 3 miles and consequently, the extent of functional connectivity among reserves or between small OGRs and larger patches of primary habitat requires fundamental changes in reserve design if populations of flying squirrels are expected to have a probability of 95 percent or greater of persisting in managed landscapes. However, this paper discounts the connectivity of the matrix component of the conservation strategy which includes riparian buffers, the legacy forest structure, and other POG areas left for other standards and guidelines such as unstable slopes or soils. Also not considered was the low-productive forest which often has enough trees to provide dispersal for flying squirrels. Squirrel densities in low productive forest, which is generally muskegs with a sparse mixed-conifer tree cover were found to be higher than those densities reported for several young-growth and POG forest types in the Pacific Northwest. In Southeast Alaska, this type of habitat likely contributes to breeding populations of squirrels and reduces risk of viability in managed landscapes (Smith and Nichols, 2003). Furthermore Smith and Person, 2007 found that the POG component of large OGRs may not need to be contiguous because interspersed low productive habitats clearly can support flying squirrels for a short time and likely facilitate dispersal.

Another thing to consider for this project is that the Honker Divide OGR complex which consists of a total of 200,000 plus acres (when including acres in a variety of LUDs) and several small OGRs bisects this project area and would provide refugia for flying squirrels and other old-growth associated species.

Smith, et al. 2011 also stated that “pre-commercial and commercial thinning of second-growth stands, which are less permeable to northern flying squirrels (E. A. Flaherty and M. Ben-David, unpublished data), will increase canopy height and create more open space in the midstory, both of which facilitate efficient gliding (Vernes 2001; Scheibe et al. 2006). Active management of second-growth stands will likely hasten succession toward achieving stand conditions that will support additional breeding populations of northern flying squirrels, potentially adding stepping-stones and migrants to a network of old-growth reserves. Therefore, the proposed timber harvest (commercial thinning) in young-growth forest in this project would provide future habitat for flying squirrels. Other young-growth forest is being considered for harvest in the future when the trees are large enough; and younger stands of 20 to 30 years old are being considered for non-commercial thinning.

Smith and Person (2007) found that there is a high probability that large isolated OGRs containing greater than 11,000 hectare (approximately 27, 200 acres) of upland POG forest likely will support flying squirrels over the 100-year planning horizon of the Forest Plan. Furthermore, the old-growth component of a large OGR may not need to be contiguous because interspersed wetland habitats clearly can support flying squirrels for a short time and likely facilitate dispersal between patches of old-growth forest.

So while both these papers determined that the small OGRs could be improved upon to increase the long-term probability of flying squirrels in isolation, they also determined that the Forest Plan small OGR composition of 50 percent upland old growth has a 73-80

percent probability of persistence of a POW flying squirrel population. The project area also includes some of, and is adjacent to, most of, the Honker OGR complex that is more than 200,000 acres in size and is adjacent to the Karta Wilderness Area which is about 40,000 acres in size.

Wildlife: Modification of Old-Growth Reserves and Landscape Connectivity

Commenters had concerns about how the small old-growth reserves were modified and whether the analysis is correct. Commenters were concerned that the OGR modifications in Alternative 3 will require a significant amendment to the Forest Plan. Another commenter believes that the OGR modifications in Alternative 3 do not provide a comparable achievement of the old growth goals and objectives. Commenters provided their own determination on which OGRs provided comparable achievement and which ones did not. A map of the proposed modifications showing past harvest, other LUDs etc. was requested. One commenter included specific requests on how to improve the OGR modifications in Alternative 3. Other commenters were concerned that adequate notice on the OGR modifications was not given as the information was not in scoping and public notice is necessary. One commenter had many specific recommendations for OGRs, and made determinations on modified OGRs as to if they provided a comparable achievement of the old growth habitat goals and objectives.

“We request that the Forest Service rescind this DEIS and re-start the scoping process because of the failure to analyze and disclose the significant amendment to the 2008 TLMP that would occur in Alternative 3.”

“The Forest Plan requires that any such modifications ‘provide comparable achievement of the Old-growth Habitat Land Use Designation (LUD) goals and objectives’ (Forest Plan, p. 3-62). The Final EIS needs to clearly disclose which Alternatives would provide ‘comparable achievement’, and which would not, for each reserve.”

“Discussions and analyses of any modifications to existing old growth [sic] reserves in the Final EIS will need to reflect recommendations included the final report. Because the report has not been finalized, we recommend that the USFS consider the summaries of alternative old growth reserve modifications provided below.”

“Further, because the DEIS did not analyze the significance of the changes, we assume that the Forest Service classified the modifications as an insignificant amendment.”“The Parnell administration’s ‘One Voice Policy’ further corrupts the biological component to the conclusions of the interagency OGR review team, and the NEPA process in general, of the BTP”

“The amount of goshawk habitat would increase in five VCUs, and decrease in five others, resulting in a net loss of 669 acres of high-volume POG. The DEIS however says essentially nothing about the significance of this change?”

“Our scoping comments requested that the DEIS include a discussion of the TLMP interagency recommendations regarding project area and connecting OGRs. This

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information is important for the public to understand project level impacts to wildlife. Alternative 4 in part responds to this request by providing maps but the discussion in the DEIS does not adequately discuss the reasons for the recommendations.”

“The TLMP Conservation Strategy Review states that ‘old-growth reserves and other nondevelopment lands serve as population sources for wolves (and possibly deer). Eliminating or degrading old-growth reserves and other nondevelopment lands will exacerbate populations issues.’ It also states that social factors will complicate the issue. “For example, declining deer numbers will motivate subsistence users to restrict non-subsistence hunters, adding that Further, it will induce demands for predator-control as a solution’, which will further deplete the Alexander Archipelago wolf population.”

“The Forest Plan directs the Forest Service to “[d]esign projects to maintain landscape connectivity.” [2008 TLMP at 4-91]. This requires maintaining corridors among large and medium OGRs and other non-development LUDs [Id.]. Our scoping comments requested a detailed map that displays connections between key wildlife corridors. We also requested that the discussion of wildlife habitat fragmentation discuss the extent to which this project will affect specific corridors and connections. The analysis needed to do more than restate levels of habitat loss – the DEIS needed to fully explain the extent of habitat fragmentation in the area to date and analyze the cumulative effects from the logging and road construction associated with this project.”

Forest Service Response:

To address habitat and sustainability on a broad scale, the Forest Plan includes an integrated old-growth conservation strategy to provide old-growth habitats in combination with other non-development land use designations (LUDs) to support viable and well-distributed of populations of native and desired non-native fish and wildlife species and subspecies that may be associated with old-growth forests (Forest Plan FEIS, pp. 3-174 to 3-175). The Conservation Strategy has two components - a system of old-growth reserves which designates blocks for wildlife habitat, and the matrix which provides for forest structure throughout the development LUDs where timber harvest is allowed. The Forest Plan decision (ROD, p. 15) states that the conservation strategy ensures the maintenance of long-term viability for wildlife species by means of a comprehensive approach based on principles of conservation biology. The Forest Plan, pp. 3-57 to 3-62, describes the management prescription for this land allocation. Part of this direction, WILD1, p. 3-62, describes the LUD Standard and Guidelines to maintain these reserves and that during project-level analysis, adjustments may be considered. The resulting reserves must provide comparable achievement of the goals and objectives of this LUD and consider the criteria in Forest Plan, Appendix K, p. K-3. This includes a review of the 2008 Forest Plan Amendment FEIS, Appendix D, pp. D- 7 and D-8.

There is no proposal as part of the Big Thorne Project to eliminate the old-growth reserve system. Modifications to small old-growth reserves (OGRs) are proposed for Alternative 3 and 4 in response to comments on the proposed action during scoping. The proposed modifications for Alternative 3 attempt to maximize the availability of the roaded land

base for timber harvest.

The proposed modifications for Alternative 4 are the interagency team's biologically preferred designs. A review was conducted using the Interagency Review Process, Forest Plan, p. K-2. The interagency team consists of wildlife biologists from the US Fish and Wildlife Service, the State of Alaska Department of Fish and Game and the US Forest Service. Their review of the small OGRs is documented in the Interagency Old Growth Reserve Review Report, Big Thorne Project, April 2013 (signed May 9, 2013), which is in the project record, as well as the meeting notes that are an appendix to the Wildlife Resource Report. As part of this review, information from past reviews were used, such as the review done for the 2008 Forest Plan Amendment and the Prince of Wales island-wide small OGR review done in 2002. Various biologists from the agencies have been involved over the years with these reviews. Although modifications were considered to the roaded land base portions of the Honker Divide large OGR, these modifications were not analyzed in detail in any alternative (DEIS, Chapter 2, p. 2-14).

The analysis of the effects of the proposed modifications to several different wildlife habitats is displayed in the DEIS comparison table in Chapter 3, Issue 2: OGR section pp. 3-55 to 3-59. This table compares the proposed modification in Alternatives 3 and 4 with the currently mapped Forest Plan OGRs. This table uses the criteria in the Forest Plan Amendment, Appendix D and Appendix K. These criteria include the shape, minimizing to the extent possible the amount of early seral habitat and roads; acres of important deer winter range; ; and potential goshawk and murrelet habitat; largest remaining blocks of contiguous old growth in the watershed and rare features such as underrepresented forest plant associations or stands with some of the Forests highest volume timber stands. Also included is whether the modified OGR design minimizes the inclusion of existing roads and young growth stands, which decrease the value of the OGR and marten winter habitat. Although not part of the criteria, an analysis of low-elevation POG and whether the small OGR provides connectivity between medium and large OGRs was included. A qualitative discussion of the effects is also included in Issue 2 by alternative.

The FEIS include maps of the proposed modifications to the OGRs showing which areas are proposed to be added or removed. More detailed maps are included in the project record showing location of POG, streams, and other features.

Landscape connectivity includes small OGRs, beach buffers, riparian management areas, other non-development LUDs, and other lands found to be unsuitable for timber harvest that maintain POG. Figure OGR-1, included in the FEIS, Issue 2 shows to some extent the connections between the large Honker OGR complex and the Karta Wilderness for the Forest Plan OGRs which are also the designs for Alternatives 2 and 5. Sweetwater Lake and the lake buffer provide connectivity between the large Honker OGR and the large Sarkar OGR to the north. Figures OGR-2 through OGR-5 shows the changes in connectivity in Alternative 3. Figures OGR-6 through OGR-9 shows the connectivity under Alternative 4. The Forest Plan conservation strategy did not assume that there was connectivity between small OGRs or between small OGRs and the mediums and large OGRs.

A determination has been made whether each of the modified OGRs provide a comparable achievement of the old-growth habitat LUD goals and objectives in the FEIS. This comparable achievement determination used qualitative factors and site-specific knowledge,

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as well as the changes in acreages. If the interagency team determines the modifications for the small OGRs provide a comparable achievement of old-growth LUD objectives, then the range of effects and conclusions for the conservation strategy made in the decision for the Forest Plan (pp. 19 to 27) remain unchanged.

Any modification of an OGR will require an amendment to the Forest Plan. Adjustments at the project-level analysis are not expected to require a significant amendment (Forest Plan p. 3-62). Amendments were made during project-level analysis for timber harvest projects prior to the 2008 Amendment. This information is displayed in the Forest Plan Amendment, Volume II, Appendix D, p. D-18. Table D-2 and shows that instead of incursions into the small OGRs that decreased the amount of OG LUD acres, the changes made to OGRs have resulted in an increase of 15,784 acres. The determination of comparable achievement for the modified OGRs, if any, would determine if the amendment will be significant or not. The Big Thorne DEIS, p. 1-6, says that OGR modification would require a Forest Plan amendment; it does not specify if the amendment will be significant or not.

See response to comments in the Goshawk section.

Wildlife: Scale of Analysis

Commenters had recommendations and concerns as to the difference scales used for analysis in the wildlife section of the Big Thorne DEIS.

“The Final EIS needs to include road density calculations for the entirety of Prince of Wales Island and for the entire project area under each Alternative (Draft EIS, Table WLD-24, p. 3-173).”

“We are also concerned that at the larger biogeographic province scale, deer habitat capability is projected to decline under all the action Alternatives from 15 to 14 deer per square mile (Draft EIS, p. 3-174). To better assess [sic] potential impacts to deer habitat, we recommend these statistics be calculated and displayed in the Final EIS for the discrete project area, in addition to the Wildlife Analysis Area, and biogeographic province scales.”

“The DEIS confines its analysis to the narrowly delimited project boundaries for most purposes, ignoring adjacent state and private lands. These non-Forest lands have been heavily impacted by logging and other human activity, and it seems as if they should be considered as part of the total picture when considering cumulative impacts to habitat.”

“For each Alternative, the Final EIS needs to provide an analysis of the past, current, and projected future composition of the landscape (excluding alpine areas), in terms of old growth, mature second growth, young second growth, non-productive forest, and non-forested lands. The appropriate geographic scales for these analyses in the Final EIS are by VCU and by the entire project area.”

“The DEIS noted that within the project area the deer and wolf protection guidelines from the current Forest Plan are not met and therefore the Forest Service has looked at the carrying capacity and the road density guidelines at a larger scale (Chapter 3 pg. 93). It was done by selecting individual WAA’s inside

and outside of the project area and then combining them into a Core WAA (CWAA) to analyze the direct and indirect effects on wolf and deer.”

“The DEIS should have included whole island deer analysis.”

Forest Service Response:

The direct effects and cumulative effects analysis areas for each resource is described by resource in Chapter 3 of the DEIS. For some resources, wildlife in particular, the cumulative effects analysis area was expanded beyond the project area boundary (DEIS page 3-140). See table below for analysis areas used. Non-National Forest System land was included in the cumulative effect analysis for most resources. Analysis areas varied by wildlife species, in some cases depending on the range and needs of that species.

Total road densities for the entire Prince of Wales island for elevations under 1,200 feet were included in the DEIS, Table WLD-26, p. 3-178. Road densities for wildlife are also generally calculated at the WAA scale and are calculated both less than 1,200 feet and at all elevations, (DEIS, p. WLD-30, p. 3-189), and for both NFS roads and all roads.

The DEIS analyzes the effects to wolves and deer as their prey base at several different scales that are ecologically meaningful and consistent with the scales used in the Forest Plan FEIS. This analysis is generally done at the WAA, multiple WAA, or biogeographic province scale in accordance to Forest Plan direction and the 2011 Deer Model direction, and not the project area which is arbitrary for the project and not a recognized land division as discussed in the beginning of Chapter 3. The analysis at the WAA scale discloses that the deer density is below 18 deer per square mile.

Scales used for Wildlife Analysis for the Big Thorne Project

	VCU	WAA	Multiple WAAs	Project area	Biogeographic Province	POW Island	OGR
Biodiversity-POG/ HPOG/ Large tree POG	X			X	X		
Fragmentation/connectivity /patch size				X			
Corridors				X			
Deer		X	X		X		
Wolf (deer)		X	X		X		
Wolf (roads)		X				X	
Marten		X		X			X
Bear (POG and Roads)		X					
Bear-riparian habitat							X
Cavity Nesters (POG/large tree POG)				X			
Marbled Murrelet (POG and patch size)				X			
Squirrel				X			X
Endemic (POG /patch size)	X						
Grouse(POG /patch size)	X						
Northern Goshawk (POG/HPOG)	X				X		
Subsistence	X			X	X		

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Wildlife: Thinning in all Alternatives

Commenters have expressed support of the proposed thinning.

“Recommend all action Alternatives in the Final EIS include second-growth management to improve deer habitat and road management to limit human access to help offset low deer numbers in the project area and move the landscape toward the Forest Plan standard of 18 deer per square mile.”

“Recommend that the Final EIS include tree thinning or pruning projects that manage slash through methods that leave stands accessible to deer, or create openings that stimulate growth but do not interfere with snow interception.”

“Commercial thinning units in Alternative 5 should be included in selected alternative. Thinning will help to mitigate future wildlife impacts in the area.”

Forest Service Response:

The FEIS includes commercial thinning in the same alternatives as the DEIS. Alternative 2, the proposed action, is the only action alternative that does not include young-growth management. Depending on the decision, the responsible official can decide to add young-growth management to this alternative during the decision making process.

Thinning and pruning treatments improve habitat for deer and will help to offset the estimated reduction in habitat quality in the area. Thinning treatments that include pruning or slash treatments are generally considered during non-commercial treatments, which are not a part of this EIS. Commercial thinning typically results in less slash accumulation since the main bole of the tree is removed and pruning is typically not necessary due to the wider tree spacing with commercial thinning.

The Forest Service believes that the benefits of thinning, both non-commercial and commercial, can also benefit deer and therefore indirectly wolves as a prey base by improving deer habitat in the long term. Most previously harvested stands in the project area within the development LUDs have been pre-commercially thinned or will be considered for treatment when appropriate.

Cole et al. 2010 in the document, Influence of Pre-Commercial Thinning on understory vegetation in Southeast Alaska Spruce Forests, showed significant difference between thinned and unthinned stands; some species responded strongly including lady fern, fireweed (good summer /nonexistent in winter) and oak fern and maintained dominance; evergreen forbs including *Cornus canadensis*, *Coptis aspenfolia*, *Rubus pedatus*, and *Tiarella trifoliata* responded strongly but decreased in dominance by year seven; shrubs like salmonberry which is good summer deer forage but poor winter forage benefited greatly from thinning and other shrubs, such as blueberry, which is both good winter and summer deer forage, did not. Even after 7 years, summer foods in thinned areas were two times as productive as unthinned areas.

Wildlife: Wildlife Travel and Elevational Corridors

Several commenters had concerns on the effects of the project on wildlife travel routes, connectivity, and corridors.

“All of the action alternatives in the Final EIS need to minimize potential impacts to Sitka black-tailed deer by avoiding harvest of forest stands that provide important winter habitat and elevational migration corridors for that species.”

“We recommend isolated elevational migration corridors be excluded from all action Alternatives in the Final EIS. Maintenance of access routes between high-elevation summer habitat and low-elevation winter range is likely to be critical in heavily fragmented landscapes like the project area. In some watersheds, deer rely primarily on relatively small remaining stands of productive old growth forest--which are now isolated between extensive second growth stands--as elevational migration corridors. Such corridors would be further fragmented or eliminated by logging units such as 183 and 184 (Baird Peak), 469 (Luck Lake), 83, 84, 424, 440, and 443 (North Thorne), 35 (Rio Beaver), 54 and 55 (Goose Creek), and 15, 17, 18, and 25 (Steelhead Creek).”

“Given the recognized importance of travel corridors and winter range to the sustainability of deer, we recommend the USFS consider modifying (under Alternatives 2 and 5) or dropping (under Alternative 4) additional harvest units. The ADFG identified the following units as being important for maintaining watershed scale connectivity for deer movements and overwinter survival, given their proximity to previously harvested units: within WAA 1315 Units 121, 123, 124, 133, 135, 138, 139, 153, 182, 183, and 184; within WAA 1318 Units 4, 5, 6, 8, 12, 14, 15, 16, 17, and 19; within WAA 1319 Units 89, 95, 98, 105, 106, 108, 111, and 112; and within WAA 1420 Units 190, 194, 201 and 203. For these same reasons, we recommend that the following units be dropped in the FEIS under Alternative 3: within WAA 1319 Units 443, 444, and 446; and within WAA 1420 Units 466, 469, 470, and 471.”

“DEIS only considers connectivity across the landscape scale (Fig WLD-1 at 3-104; 3-102 to 106; 3-145-159), not vertically. There was no discussion, and the alternatives maps are inadequate for judging the effects on elevational connectivity because habitat characteristics are not shown on them and there are no contour lines.”

“This remaining old growth has significant value, including for wildlife movement.”

“Valuable deer, bear, and wolf habitat that has already been hit by large industrial-scale logging. The proposal calls for clear-cutting the remaining gaps between previously logged areas, blocking wildlife movement up and down entire mountainsides.”

Forest Service Response:

In addition to the landscape connectivity maintained as part of the conservation strategy, wildlife travel corridors were analyzed in Chapter 3, Issue 3. In the DEIS, probable

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wildlife travel corridors within the project area are shown on Figure WLD-1, p. 3-105 and explained in the text. Most of these corridors are associated with drainages and the riparian management area buffers provide some of this connectivity. Alternative 4 was designed to minimize impacts of timber harvest of forest stands that seem to provide important winter habitat and elevational migration corridors. Other action alternatives, as well as Alternative 4, minimize the effects by varying degrees by the use of uneven-aged silviculture prescriptions, increasing buffer widths or the implementation of the Legacy Stand Structure Standard and Guideline. The effects to these corridors are discussed in the DEIS, pages 3-145 to 3-3-159. Of the action alternatives, Alternative 3 has the most effect to these corridors and Alternative 4 has the least.

An elevational corridor is a corridor used by some species to access between low and high elevation areas. Some deer are migratory and will migrate between the low-elevation winter ranges to higher elevations in the summer for forage. Other deer do not migrate referred to as resident deer and tend to stay in the same general area year round (see McNay, R. S. 1995. The Ecology of Movements made by Columbian black-tailed deer. University B.C., Vancouver, B.C. PhD Thesis. 194 pp.; BC -Ministry of Forest Brochure-39 2 of 5; 1996. Clarifying Habitat Use; BC -Ministry of Forest Brochure-40 3 of 5; 1996. How Black-tailed Deer React to Logging in their Winter Habitat; and BC -Ministry of Forest Brochure-58 5 of 5; 1996. Habitat Assessment and Planning). Discussion of the effects to elevational corridors has been added to the FEIS.

The Forest Service IDT addressed each of the specific units that commenters provided concerning elevational travel routes and deer winter range. A report that includes the consolidated comments regarding units with specific deer winter range and/or elevational travel route concerns and the response has been included in the project record.

Unit specific: Individual Unit Economics And Selection

Several comments expressed concern about the economics of individual units and that their inclusion into the EIS at the planned prescription and/or logging system reduces project economics.

“The unit is deficit as designed.”

“This unit is extremely deficit.”

“This unit will not appraise positive as currently proposed.”

“This unit will likely not appraise with a full profit and risk allowance unless the timber is above average value.”

“We recommend you drop the unit.”

“We recognize that some of the marginally economic units may appraise positive when combined with more profitable units, but inclusion of marginal units will reduce the overall sale economics.”

Forest Service Response:

The analysis required for the EIS is for project-wide economics by alternative, not by individual unit economics. The outcome desired after the ROD (if an action alternative is

selected) is for a timber sale or stewardship project (Integrated Resource Timber Contract) to be offered. While preparing a timber sale or stewardship; units within the project can be bundled to create an economically positive timber sale or stewardship contract.

The following sections discuss a number of units in more detail.

Unit specific: Do Not Include Legacy Forest Structure (legacy areas)

Commenters stated that legacy areas should not be used in certain areas to improve unit economics or expand the units. This applies to comments about the following units: 597.2-036, 597.2-097, 597.2-054, and 586-135.

“I would suggest you drop the legacy set-aside in order to enlarge the unit.”

Forest Service Response:

Retention of legacy forest structure areas are required by the Forest Plan Standards and Guidelines (Forest Plan, p. 4-90) to maintain enough old-growth forest habitat within a specific VCU where greater than 33 percent of the old-growth forest has been harvested or more than 67 percent of the old-growth forest is projected to be harvested during the Forest Plan planning horizon. Please see the description of how required legacy forest structure was determined in the introduction to the unit cards (DEIS, Appendix B) and the legacy discussion section in DEIS, Chapter 2, pg. 2-10. The planned legacy areas may be different between alternatives for the same unit to meet different resource objectives for that alternative, and are based on the silviculture prescriptions. The legacy areas may be modified at implementation, but will still follow the Forest Plan objectives.

Unit specific: Plots to Assess Timber Value

Several comments expressed a wish to further investigate individual unit characteristics at the EIS stage to determine stand and species composition, as well as log grade and resultant value.

“We recommend that you put a few cruise plots in the units to get a better idea of the timber values.”

Forest Service Response:

A timber cruise will be performed before a timber sale or stewardship project is offered, to conform to FSH 2409.12. This is not done on a unit-by-unit basis (unless that is the size of the sale or stewardship) as it would be too costly to meet standards required while providing useful data at that scale. Economics are not analyzed at a unit-by-unit basis, but rather a project basis. Economics will also be analyzed at the time of offer for a timber sale or stewardship project.

Unit Specific: Road Economics

Commenters expressed concern that roads accessing come units may have too great of a cost to account for the value of the volume access by it. This applies to comments about the following units: 595-005, 595-011, 597.2-033, 597.2-036, 597.2-043, 597.2-050,

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597.2-053, 597.2-056, 597.2-057, 597.2-063, 578-066, 578-070, 578-072, 578-079, 585-139, 585-140, 585-141, 585-142, and 595-360.

“This unit has a road amortization rate of about \$150/MBF.”

“Utilize reclaimed rock from nearby roads.”

“Use a rock pit in the vicinity.”

Forest Service Response:

Individual unit economics are balanced with the purpose and need of the project. Road construction for a specific unit may not always be balanced economically at that scale. However, each alternative attempts to balance the volume of timber offered with economics and other resource concerns identified by that alternative. The least costly method for planning harvesting and accessing timber as described in Forest Service Manual 2400, Chapter 2430, Section 2432.22c - Financial and Economic Analysis is used for every unit.

Due to the suitability of acres within the project area, the effect of inventoried roadless areas on harvest possibilities and other resource concerns, constructing roads where the value of the timber harvested minus other costs does not exceed the road construction costs may still meet the needs of the project in some circumstances.

In performing the coarse level cost assessment at this scale, relatively minor cost centers such as rock pit location and rock reclamation are not analyzed by unit, but generalized for analysis. At the time of implementation, decisions about rock pit location and possibly reclaiming rock from existing roadbeds will be made.

Unit Specific: Unit Expansion

Numerous comments expressed a wish for certain units to be expanded, especially for helicopter yarding areas. This applies to comments about the following units: 584-158, 584-159, 584-161, 584-162, 584-168, 584-169, 584-171, 584-174, 584-175, 584-177, 584-179, 581-197, 581-200, 581-201, 581-202, 581-203, 580-395, 580-402, 580-405, 580-407, 580-420, 580-421, 580-439, 580-446, 580-450, 580-455, 580-465, 580-466, 580-473, 580-475, and 580-476.

“We also recommend that the high elevation helicopter units be enlarged in order to compensate for the small percentage of timber that can be economically harvested from each acre.”

Forest Service Response:

Most of these areas encompass all logical, suitable, and available timber that is outside of the inventoried roadless areas and avoid other resource concerns to meet Forest Plan Standards and Guidelines as well as best management practices.

Unit Specific: Unit Preference

Numerous commenters expressed a wish for certain units to be dropped from the project or ROD. Additionally, some commenters had specific unit design or road design

recommendations. This applies to comments about the following units: 595-011, 595-018, 595-019, 595-025, 597.2-036, 597.2-037, 597.2-046, 597.2-047, 597.2-049, 597.2-050, 597.2-051, 597.052, 597.2-053, 597.2-055, 597.2-056, 597.2-057, 597.2-060, 578-067, 579-069, 580-089, 580-090, 580-091, 580-093, 597.1-117, 579-121, 579-122, 586-125, 586-126, 586-130, 584-147, 583-178, 583-180, 583-181, 583-185, 583-187, 581-189, 581-190, 581-195, 581-206, 582-207, 582-212, 582-213, 595-365, 579-368, 579-369, 580-395, 595-402, 595-403, 595-405, 595-407, 597.2-420, 597.2-421, 597.2-422, 586-426, 586-427, 586-428, 586-429, 586-430, 586-431, 586-433, 586-434, 586-435, 580-443, 580-444, and 580-448.

“Most of the unit could be shovel logged.”

“Dropping the helicopter volume is probably the best idea.”

“We recommend you drop the unit.”

“We recommend you try to extend the spur and make a much larger unit.”

“The fringe of timber just above the slope break could be partial cur with a helicopter.”

“Convert it to a light partial cut and greatly expand the size to compensate for the volume reduction that will result from partial cutting.”

Forest Service Response:

Preferences by commenters to include or exclude particular units will be noted by the decision maker for the ROD. Individual unit design and road design recommendations were taken into account when finalizing those items for the FEIS. Individual units may have responses regarding some of the more-specific statements.

Unit Specific: Volume Estimates

Commenters stated that they did not think that the volume estimates provided on the unit cards were accurate. This applies to comments about the following units: 581-195, 581-197, 581-200, 581-201, 581-202, and 581-203.

“We doubt that this higher elevation unit will average 30 MBF/ac.”

Forest Service Response:

Volume estimates were developed from information gathered during walkthrough stand exams. These volumes are based on the best information available at the time. Actual harvest volume as compared to these estimates is expected to vary on a unit-by-unit basis contingent on the accuracy of the samples and observations. See page 3-23 of the DEIS for a description of how volumes were determined.

Note that volume estimates generated are not statistically significant for individual units, so estimates at that scale are just that, estimates. To estimate with a reliable degree of statistically significant accuracy at the scale of one unit would be very expensive and is beyond the scope of this EIS. See Timber Economics: Financial efficiency analysis for a description of when a statistically significant estimate will be made.

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Unit Specific: Road and Unit-Specific Comments

Some commenters had site-specific comments and specific recommendations or proposals about individual roads and units in the Big Thorne Project.

“Unit 595-3...if an 800-foot spur was constructed into the unit from the north, the unit could be shovel and or cable logged”

Forest Service Response:

A temporary road at the location described would not be a cost-effective solution to harvest that unit.

“Unit 595-18...if you cannot easily access the unit with a spur, we recommend you drop the unit.”

Forest Service Response:

The unit cannot be easily accessed with a spur, due to topography and streams. The unit will be kept in as a helicopter unit. See Unit specific: Unit preference response.

“Unit 595-19...The unit should be enlarged to include all of the timber up to the existing high road.”

Forest Service Response:

The upper road (NFS Road 2030100) is in OG LUD, therefore is not suitable for timber harvest. Although adjustments to OGR LUDs are recommended in some VCUs, this is not one of them. The unit design in the FEIS in Alternatives 2 and 3 comes to the LUD boundary in the east and north.

“Unit 595-24...It looks like a lot of this unit could be shovel logged with access from the existing road to the north.”

Forest Service Response:

As noted in the Scenery section of the unit card, this area is foreground; therefore, can only have a very limited opening size, which would limit the economic efficiencies of constructing a road to access and conventionally harvest the unit.

“Unit 597.2-33...The timber stand is much larger than the unit, so we recommend you...enlarge the unit to encompass all of the commercial timberland.”

Forest Service Response:

Although the stand of timber is much larger than the proposed unit (which has been enlarged slightly to the east in the FEIS), all of the area to the west and north of the unit is in an inventoried roadless area, limiting the area available to harvest.

“Unit 597.2-59...We recommend you redesign the road to harvest as much as you can reach from the existing road plus add volume on the lower side of the main road and drop the new road construction.”

Forest Service Response:

The design on this unit has changed in the FEIS, removing the proposed road and including more harvest from NFS Road 3013150, similar to these recommendations.

“Unit 578-65...The stand could be accessed with a 1,800-foot spur from the north.”

Forest Service Response:

This proposed road location has been changed in the FEIS to access the unit from the north, similar to the recommendation.

“Unit 580-92...We recommend you drop the helicopter portion of the unit. The unit is only 3.5 acres to begin with, but shovel logging about half of the acres might be feasible.”

Forest Service Response:

The unit has been changed to shovel yarding.

“Unit 580-93...If a single crossing (over and back) were allowed on the south stream, the small area could be shovel logged and the logs passed over the creek and then passed onto the existing spur road.”

Forest Service Response:

The average yarding distance using the recommendation of going across the stream would likely be in excess of 1,000 feet. It would be unlikely to improve economics, due to the requirements and mitigation needed to receive approval to do the type of action recommended.

“Unit 583-180...We recommend this cable logging unit should be greatly enlarged to reduce the road amortization.”

Forest Service Response:

There is no proposed road construction associated with this unit, so road amortization concerns should not exist. The unit cannot be expanded uphill to the southwest due to unsuitable soils that define the edge of the unit.

“Unit 583-181...We recommend you schedule the entire 60 acre leave strip as a cable harvesting unit.”

Forest Service Response:

The proposed harvest area for this unit is the only suitable area left from the setting. The rest of the setting is not suitable for harvest due to unstable soils. The unit’s prescription has been changed to 75 percent retention.

“Unit 583-187...This unit is so tiny the short spur road will create a deficit appraisal and it is hardly worth moving up and setting up a cable yarder for just 3 acres. We recommend you extend the spur and make a much larger unit.”

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Forest Service Response:

The area to the west of the unit, where it appears that expansion may be feasible, was identified as unsuitable soils in the Forest Plan.

“Unit 581-189...We recommend you find out if this unit could be accessed with a road from unit 583-187.”

Forest Service Response:

Road access from the mentioned location would be extremely expensive due to the side slopes and numerous incisions that would need to be crossed. This unit also has a low acreage available for harvest relative to the proposed road length and cost.

“Unit 581-191...We recommend you allow shovel logging for all of the timber in this unit. Also, the visual buffer will likely blow down, so we recommend you schedule those acres to be logged also.”

Forest Service Response:

It is unlikely that shovel yarding the whole unit will meet best management practices. Windfirmness of the visual buffer is taken into consideration when implementing the unit.

“Unit 581-195...We recommend you...greatly expand the size to compensate for the volume reduction that will result from partial cutting.”

Forest Service Response:

This unit cannot be expanded to the south due to unsuitable soils and required legacy.

“Unit 582-212 & 213...We recommend you drop these two units, designate a road along the beach from Ratz Harbor to Eagle Creek and add sufficient cable and shovel logging to justify the cost of the road.”

“Unit 436...A better alternative would be to build the beach road between Ratz and Eagle Creek and log several cable and shovel units along the way.”

Forest Service Response:

The recommended road location crosses through multiple inventoried roadless areas.

“Unit 595-360...We recommend you increase the size of the unit.”

Forest Service Response:

In Alternative 3, two additions to this unit were made to the FEIS. The south addition goes to the inventoried roadless area boundary, while the north addition goes to the steep slopes to the north and unit 580-407 to the west.

“Unit 580-363...We recommend this unit be cable logged with a 4,000-foot spur.”

Forest Service Response:

An attempt to locate an economically feasible road took place during field reconnaissance.

“Unit 575-392...We recommend this unit be enlarged to reduce the road amortization.”

Forest Service Response:

This unit cannot be expanded to the north due to an inventoried roadless area, to the east due to non-merchantable timber, to the west due to TTRA buffers, and to the south due to past harvest, TTRA, and RMA buffers.

“Unit 572-394...The upper slope in the NE corner of this unit has unstable slopes and poor tailholds – there are several mini-slides on this slope already. We recommend lowering the backline a little to slopes that are less steep and more stable.”

Forest Service Response:

The upper area of this setting has been changed to 75 percent retention with helicopter yarding. Soils has reviewed this unit for unsuitable soils. The upper extent of cable yarding has been moved downhill. These changes are similar to the recommendations made.

“Unit 580-448...This unit could be cable logged all the way to the slope break – about 700-feet up the hill.”

Forest Service Response:

This unit has unstable slopes above the current harvest area, so it is unsuitable for harvest.

“Road 2000440 — Enters Kogish roadless area for about 0.4 miles. Old road in storage. Storage category A.

There is no site-specific comment on erosion control of this 1.79 mile segment of existing road in storage. The road card just says somebody will make a plan – but what is the existing condition? Suggests RCS data don’t match GIS streams – not sure what surveys have been done of this road. Under stream crossings the narrative says this road doesn’t cross any Class I or II streams, but the map of the road shows now fewer than nine class-II stream crossings. This road also appears to cut through an old (1989) clearcut, which cut riparian zones around the class-II streams being crossed. This should be a consideration for cumulative effects, both for aquatic species, and wildlife (ie. loss of riparian connectivity).”

Forest Service Response:

Existing condition - this road is well stabilized with little effect to resources. Two crossings requiring bridges are planned to be installed. An erosion control plan will be developed by the road contractor in accordance with BMP 14.5, as required by the contract, and approved by the Contracting Officer. The plan will be consistent with the approved operating plan or construction schedule.

Additional road surveys were completed and the road cards narratives have been updated for the FEIS and located in the project record. Any discrepancies between the road card map and the road card narrative will be explained in the Introduction to the Road Cards located in the project record. All installed fish crossing structures will meet fish passage

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standards. Effects of past harvest are analyzed in the respective resource sections. This road and the mapped stream crossings were included in cumulative watershed effects analysis in the EIS.

“2030110— storage category A. 0.48 miles. Currently in storage. I do not understand how the narrative for a stream crossing can show cutthroat trout verified present both up and downstream, and also 0 m of available upstream habitat. The RCS data indicates a number of problems were found here in 2002. There was surface erosion with diversion potential at MP.009, for example, and cutslope erosion a bit further up the road. See PR 736_1265, lines 39809 and 39810. Please consider these and other problems, including whether they have been fixed, and apply that information to the effects analysis (e.g. fisheries).”

Forest Service Response:

This road has been stored with structures removed and waterbars installed to address erosion concerns. Additional road surveys were conducted to provide information for the FEIS effects analysis. Currently, there are several areas in which the cut banks along this road are eroding and transporting sediment into the inboard ditch. The ditch relief culverts in these areas are allowing the water to move downslope and are dispersing into forested terrain. These ditches are not flowing into stream courses. One area of the inboard ditch has been blocked by sediment and is eroding the road prism for about 70 feet. This site specific information has been updated in the resource reports and FEIS and the amount of available upstream habitat has been updated in the road cards that are located in the final project record. All the information disclosed in Chapter 3, Issue 4 was used in analyzing impacts to fish habitat (aquatic habitat) and consequently effects to fish populations (fisheries). In the Big Thorne DEIS and the FEIS, the Fisheries section tiered back to Issue 4 for parameters that were discussed there and disclosed additional information relevant to fish habitat and fish populations. See responses to Fisheries: Fish Habitat, Hydrology: Road Effects, and Hydrology: Watershed Analysis, Cumulative Effects, and Insufficient Information.

“2030200 and 2030210– ATV trail after closure. But it also appears to be shown as “stored” and self-maintaining. A road being used, even by ATVs, can’t be self-maintaining. RCS data show a number of failures and maintenance issues on this road, which aren’t particularly addressed in the EIS. Please include this information in the FEIS, and disclose and fix all road failures.”

Forest Service Response:

We recognize that an OHV trail will require some level of maintenance. If funding cannot be secured to maintain an OHV trail, OHV use will be prohibited and the road prism would be maintained in a stored condition.

Any road failures and maintenance issues will be addressed through the timber sale contract and be the responsibility of the purchaser. Roads will not be approved for timber haul until they meet Forest Plan Standards and Guidelines and best management practices.

“3000210— The map of road 3000210 shows two class-I stream crossings, but only a few class II crossings are identified in the narrative. This will be a

damaging set of crossings too, as both streams are clearcut or being clearcut on both sides.”

Forest Service Response:

Additional road surveys were completed and the road cards narratives have been updated for the FEIS and located in the project record. Any discrepancies between the road card map and the road card narrative will be explained in the Introduction to the Road Cards located in the project record. All fish stream crossings will be designed to meet fish passage standards. Bridges or log culverts would be placed over fish streams on reconstructed roads where crossings had been removed during previous storage activities. As directed by the Forest Plan and TTRA, all Class I and II streams receive a minimum non-cut buffer of 100 feet with additional area protected depending on process group, sensitive riparian soils, elevated windthrow concern, and other relevant resource concerns. Road reconditioning will meet Forest Plan Standards and Guidelines and applicable best management practices.

“3000306 – Please consider the effect of this road in channeling sediment into the class II stream segment, via the 3000000 road, and whether this is a point source of sediment.”

“3000310— please consider effects to the class II and class I stream below the slope, in particular any diversion of streams or sediment runoff that could reach the stream.”

Forest Service Response:

All roads in the project area are surveyed for appropriate site-specific erosion control measures. The effects of any road project on adjacent streams are always a priority during implementation. Measures to minimize impacts to streams are undertaken at the project level. Contract specifications and best management practices (BMPs) are implemented to minimize negative effects to streams.

An erosion control plan detailing permanent and temporary control measures to minimize erosion and sedimentation during and after construction is required prior to any road construction or reconstruction. This plan is developed by the contractor and approved by the Forest Service.

BMPs are in place and enforced to prevent negatively impacting water quality. The road card narratives have been updated to address these concerns. Along the 3000306 road segment there is one Class IV and multiple non-stream drainages present. During the different road and unit surveys no erosional features were identified along this road segment that could transport sediment into the Class II stream or the Class I stream adjacent to the 3000000 road.

Along the 3000310 road there is one Class II stream crossing at milepost 0.22 and an existing stream crossing structure is already in place. Approximately 275 meters of the existing road prism was built in the riparian area of this Class II stream. During the different road and unit surveys no erosional features were identified along this road segment that could transport sediment into the Class II stream.

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"3012000— the map does not reflect the narrative, as more than one, (4?) class I stream crossings are depicted here. In particular, the end of the road is a worrying-looking series of crossings as the road meanders up the streams. But the narrative only mentions the single crossing in cell H2 of the road card map, as though only the first small segment were proposed.

This road should be analyzed for point source sediment discharge, as the ditching may be depositing sediment into the streams. This road segment also has ARD potential, making good monitoring information all the more important.."

"Road 3012200— reconstruction of .84 miles to facilitate helicopter yarding. The Stream Crossings comments narrative notes that Rio Beaver Creek was erroneously considered a Class IV stream in the RCS data.

The map appears to show three class I and a class III crossing, not a class I and a class II as are listed.

Combined with the 3012210 road (stored), that riparian area would be gainfully left alone. The road appears to dip into the riparian management area (presumably a windthrow addition on the class I stream?)"

Forest Service Response:

Additional road surveys were completed and the road cards narratives have been updated for the FEIS. Most of the proposed roads have been surveyed for potential stream crossings and drainage needs. All roads in the project area are surveyed for appropriate site-specific erosion control measures. All appropriate BMPs will be applied. Any discrepancies between the road card map and the road card narrative will be explained in the Introduction to the Road Cards located in the project record.

"Road 3012210— This is a long road with numerous stream crossings of tributaries to a class-I stream just below. The road appears to cross the class-I stream in cell H1 of the map, yet this is not reflected in the stream crossings information."

Forest Service Response:

Road 3012210 does not cross the Class I stream in cell H1 of the map. Road 3012210 intersects road 3012200 which does cross the Class I stream.